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Spring is in the A

Spring is a time of hope for our fighting overseas just as it is for us in Canada. While hope is for release from wartime difficulties and restrictions, theirs is for release from stark discomfort, cruel disease, wounds and death.

So let us, with our lighter burdens, be as realistic as they are in theirs. The victories for which we are so thankful must not blind us to the stubborn core of fanaticism in our enemies — to the ruthless hate that fights on with courage of despair.

Already it has brought a sharp increase in the production expected for victory. Deadly enemy weapons must



CANADIAN GEOGRAPHICAL JOURNAL

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This magazine is dedicated to the interpretation, in authentic and popular form, with extensive illustrations, of geography in its widest sense, first of Canada, then of the rest of the British Commonwealth and other parts of the world in which Canada has special interest.



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The British standard of spelling is adopted substantially as used by the Dominion Government and taught in most Canadian schools, the precise authority being the *Oxford Dictionary* as edited in 1936.

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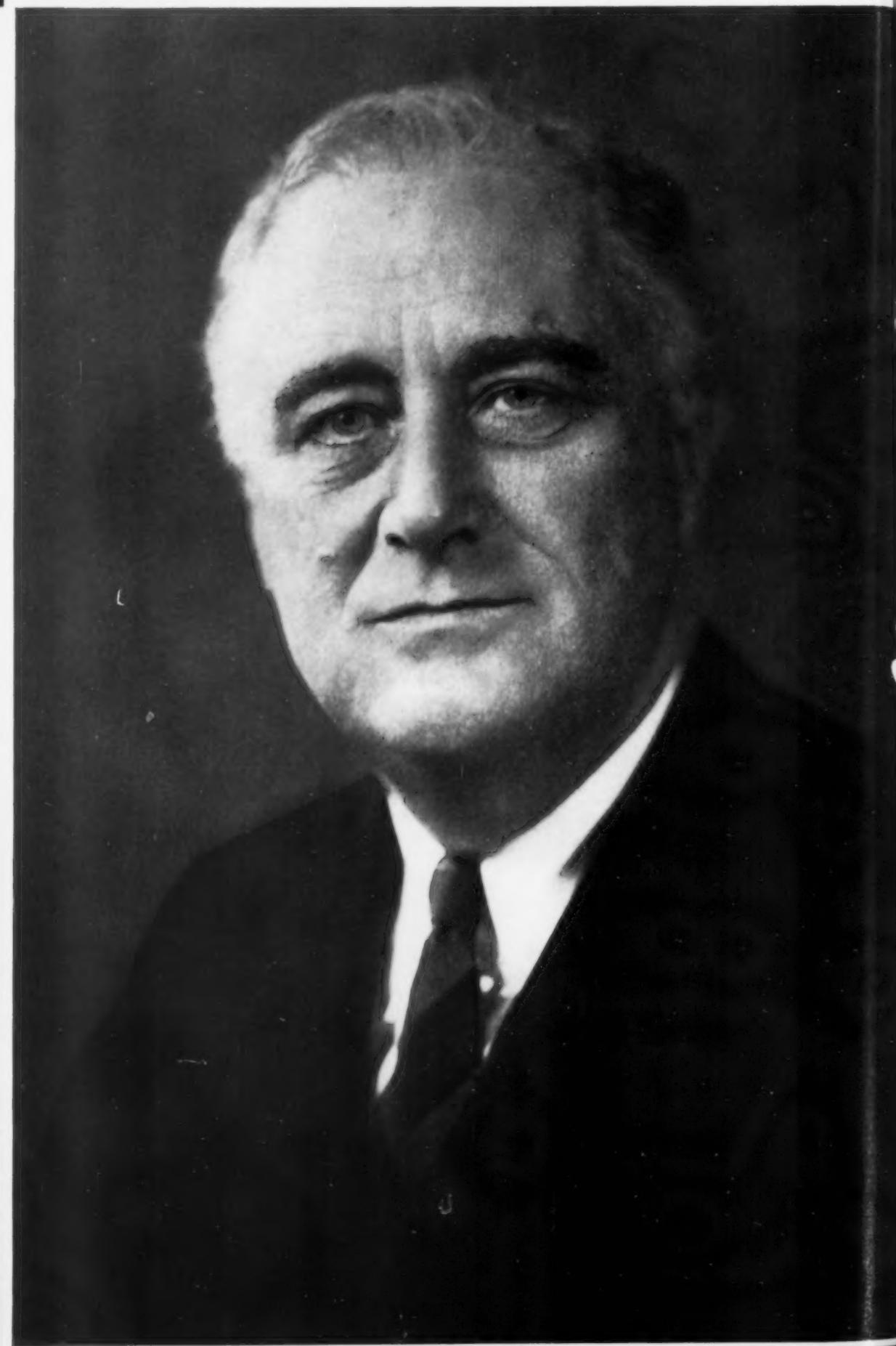
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Franklin Delano Roosevelt

1882 – 1945

No other leader of any foreign state has ever won for himself a place in the hearts of Canadians comparable to that occupied by the late President Franklin Delano Roosevelt. Other Presidents have been accorded the esteem and honour due the head of a great and friendly national neighbour, but it remained for Mr. Roosevelt to capture the affection of the Canadian people to a degree that is without precedent. The news of his death brought to millions of Canadians a profound sense of personal bereavement.

This was not due—at least, not primarily due—to any misgivings as to the future progress of the War. Already the garlands of victory were being woven for the shoulders of the United Nations. Regret there was, indeed, that he was not spared to hear the bells of victory ring. But the sadness that swept Canada like an electric wave that brilliant April afternoon had in it no toxin of selfish interest; it was like the sadness which comes when the family circle is broken and the heart is clutched in a sense of irreparable loss.

President Roosevelt's relationship to Canada was unique. From his summer home on one of our sun-lit bays to his presidential visits to Kingston, Ottawa, and Quebec, his touch invariably seemed to radiate affection and goodwill. But it was through the mysterious channel of the radio that he found his way into Canadian homes and hearts. When the President spoke, even to his own people, he had an audience in Canada which included not only the great centres of population but reached into the most remote homestead or mining camp in the Dominion. And when the word went around that the "President" was to speak, every one knew who was meant. There are many presidents of this and that, but there was only one "the President". He entered our family circles, he sat by our family firesides, he spoke to us as friend to friend. No voice (save one) in all the world drew such a response from the Canadian people.

In those dark days when it seemed that the British family stood alone, his voice brought comfort and courage. We knew something of his task in uniting a diverse people in a common cause, which to some seemed outside their field of realities; in revealing the stark disaster which threatened all civilization with an arrogance so stupendous that to many it seemed unbelievable; but we never doubted his purpose or his ultimate success. By his foresight, his judgment, and his energy he saved the world.

And this he accomplished under a handicap which to a lesser soul would have seemed insurmountable. Certainly few men of wealth, with no driving necessity save the urge of their own spirits, would have undertaken such a task. When his contributions to the world are counted, not the least of them will be this—that he demonstrated in his own person that "the immortal spirit hath no bars to circumscribe its time or place".

He has laid down his burden almost at the moment of victory in Europe, and near enough to know that victory, wherever human liberties have been challenged, will be certain and complete. As Wolfe said, while the battle smoke still hung over the Plains of Abraham, "Now God be praised, I die in peace", so may Franklin Roosevelt, in the words of one of his country's poets,

"Wrap the drapery of his couch about him
And lie down to pleasant dreams".

Robert J. C. Stead



Commercial Relations Between Canada and the United Kingdom

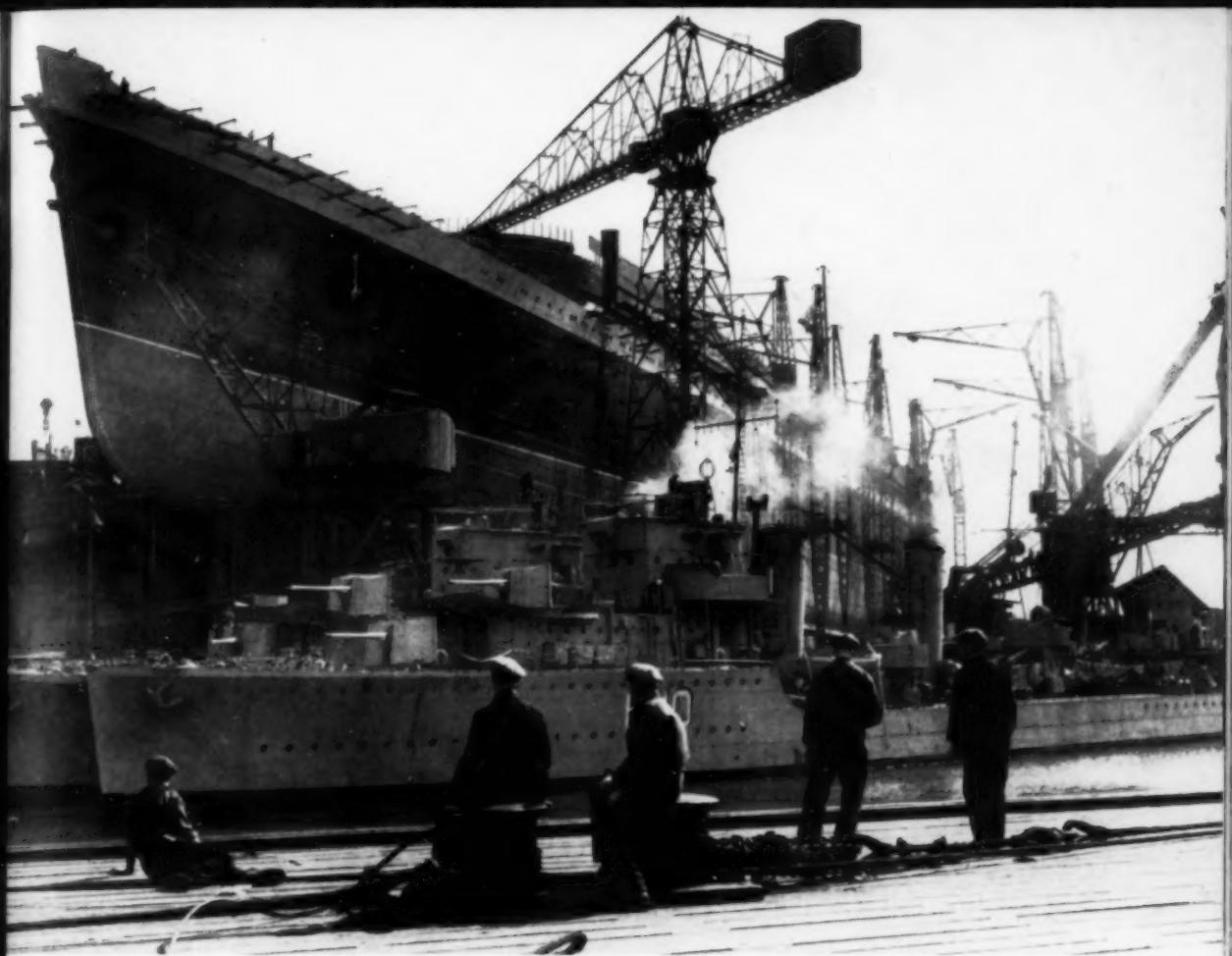
by ARTHUR L. NEAL

EXPORT TRADE is the most potent vitalizing force in Canada's economic life. This country possesses a great abundance in a comparatively small variety of natural resources—a fact which has had tremendous influence on the Dominion's economic development. Having prodigious capacity in certain specialized fields of production, yet lacking population great enough to constitute an adequate domestic market, Canada has had to look abroad for markets in order to foster the profitable and economic exploitation of natural resources and the development of

industry based upon them. In each of the main fields of Canadian primary production, export trade is indispensable.

The United Kingdom was Canada's largest pre-war external market. In each of the years 1932 to 1938, inclusive, exports to the United Kingdom exceeded those to the United States and ranged from a low of 36.4 per cent of total exports in 1932 to a high of 42.2 per cent of total exports in 1936. The highest proportion of total exports taken by the United States in these years was 36 per cent, registered in both 1935 and 1937.

At top:—The waterfront of Port Arthur, Ontario. Grain from the Canadian West is transferred from trains to lake freighters which take it down the Great Lakes to the St. Lawrence River. It is then loaded on ocean-going vessels and transported overseas.



Britain is justly proud of the prowess of her shipbuilders, and there can be no better example of this than the Queen Elizabeth here shown in the yards of her builders on the Clyde. During the war the shipyards of England, Scotland and Northern Ireland have been mainly occupied with the building of naval vessels of all kinds. After the war they will be turned rapidly to the task of restoring the country to her position among the foremost of the world's carriers.

Indicative of the high importance of the United Kingdom market to Canada is the fact that in the last full pre-war year, 1938, exports to that country equalled 3.3 times the value of exports to the rest of the Empire, 24 times the exports to South America, and 9.4 times the whole of the exports to the continent of Asia. In fact, in 1938, exports from Canada to the United Kingdom were one and one-half times as great as exports to the rest of the world, excluding the United States. It is clear beyond any doubt that even should the United Kingdom become relatively less important as a market in the post-war era, it will, nevertheless, remain of paramount importance.

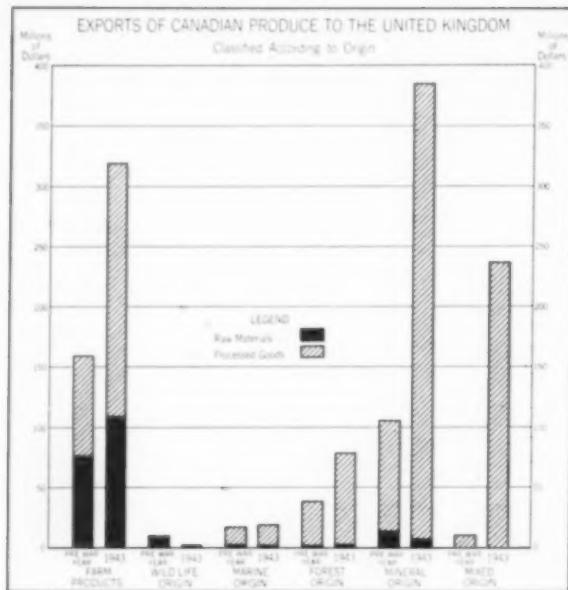
Because of the nature of Canada's import needs and partly, also, because of her proximity to the United States, which produces

many things particularly adapted to Canadian tastes and requirements, the United Kingdom does not bulk so large as a source of supply as a market. Nevertheless, imports have been consistently heavy, and the United Kingdom ranked in peacetime as the second largest source of supply.

From the United Kingdom viewpoint, it may be mentioned that, in peacetime, Canada ranked in second place as a supplier of imports accounting for nine per cent, and ranged from fourth to sixth place as a market for United Kingdom goods, taking about five per cent of the total.

THE UNITED KINGDOM MARKET FOR CANADIAN GOODS

The Dominion Bureau of Statistics has classified exports according to the main divisions of extractive industries. The diagram



(see above) shows this breakdown for a pre-war year and for 1943. It will be seen that profitable export outlets in the United Kingdom have contributed to employment and prosperity in all fields of primary industries in Canada and that the market is hardly less important to producers of a wide range of processed articles.

AGRICULTURE

Before the war, the largest group of ex-

ports was agricultural products. This reflects the basis of trade between Canada and the United Kingdom arising out of the complementary nature of their economic structure. Before the war, agriculture was Canada's most important primary industry and provided a livelihood for about one-third of the gainfully occupied population. On the other hand, the United Kingdom has a density of population exceeded only by Belgium and the Netherlands. Taking England, Wales, Scotland and Northern Ireland together, there were, in 1940, 507.2 persons per square mile, as compared with 3.3 persons in Canada, 382 persons in Germany, and 105 persons in China. Great Britain was obliged to import about two-thirds of its foodstuffs.

Since the war began, lack of shipping space and the need to conserve foreign exchange have resulted in the ploughing up of six million additional acres of land in Britain and the reclaiming of about three million more in an endeavour to increase food production. By strict rationing, Great Britain has also adjusted eating habits to readily available types of foods and has, through these measures, been able to reduce imports from two-thirds to approximately one-third

Farmers in the Canadian wheat fields threshing the wheat as it is harvested. In the threshing machine, the wheat grains are beaten from the stalks and the straws blown into a pile. More modern system is the combine which threshes the wheat as it harvests it, all in one operation, the grains being blown out into trucks that follow the combine through the fields.





Grain conveying system, Bristol, England

Courtesy Port of British Authority

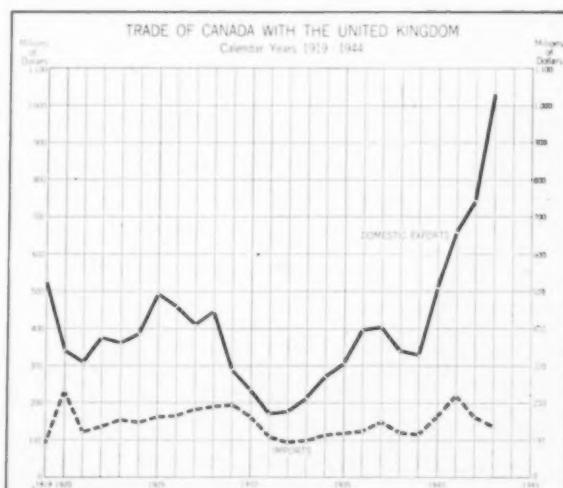
of consumption. Nevertheless, since many former sources of supply were cut off, exports of farm products to the United Kingdom have about doubled. In this group, the principal items are wheat and flour.

Besides wheat, Canada's exports of bacon to the United Kingdom, which were increasing for many years, have been given a special impetus by the war, particularly since the occupation of Denmark, in peacetime one of the world's largest producers of high-grade bacon. Exports of meats to the United Kingdom in 1943 were valued at \$122 millions as compared with \$34 millions in 1938.

Among other food products, exports of apples and canned apples have been drastically curtailed, while dehydrated apples increased from a value of only \$13,000 in 1938 to nearly one-half million in 1943. The United Kingdom is of exceedingly great importance to apple growers in Canada, and the loss of export trade during the war was a severe blow because of the importance of the industry and of the necessity for maintaining its productive capacity. The Dominion Government has provided guarantees, involving substantial expenditures, to insure reasonable returns to growers and handlers of the crops.

Despite increased fodder production in the United Kingdom, livestock herds there have been reduced, as it was felt that greater emphasis should be placed on food for direct human consumption rather than on animal foodstuffs in order to make the best use of land. Total imports of fodder had fallen from 8,500,000 tons before the war to 1,300,000 tons in 1942-43. This is reflected in Canadian exports of coarse grains, barley, buckwheat and oats, all of which have declined or been eliminated.

Exports of vegetables, with the exception of dried varieties, have also shown substan-



tial declines or been practically eliminated. Exports of this item were nil in 1938 but mounted to over \$1½ millions in 1943, and have advanced still farther in 1944. The dehydration of vegetables has been an important war development.

The trend of exports of cheese to the United Kingdom was downwards prior to the war, but has more than doubled since. The fourth cheese contract between the United Kingdom and Canada was for 150 million pounds to be shipped from April 1st, 1943, to March 31st, 1944. The contract price, reported at 20 cents f.o.b. factory shipping point, is supplemented by a Dominion bonus payment and provincial subsidies in Ontario and Quebec. In order to meet British needs, Ontario and Quebec cheddar cheese was removed from the domestic market during the summer of 1943.

Exports of eggs to the United Kingdom were inappreciable before the war, and up to May, 1940, this trade was by private firms to private British importers. In May, 1940, the British Ministry of Food became sole importer, and, in April, 1941, control of exports from Canada was assumed by the Special Exports Products Board. Exports from Canada amounted to 1,274,000 dozen in 1939. By 1943, a new contract with the United Kingdom called for the largest total exports of eggs in the history of Canada. The Special Exports Products Board agreed to purchase 9,000 long tons of dried egg products, the equivalent of 63,000,000 dozen eggs. Since the beginning of 1942 Britain has been importing only dried eggs in place

of fresh and storage eggs in the shell. This more concentrated form is preferred because of greater ease of storage, shipment and general handling. The contract called for half of the total quantity of egg powder to be shipped in 5-ounce packages, each package containing the equivalent of one dozen eggs. This package is for direct distribution to consumers and fits in with the British rationing programme. The remainder is shipped in 14-pound packages for distribution to the restaurant trade. Under this agreement, shell eggs are purchased by the Special Products Board at prices f.o.b. Montreal, ranging from 33 cents to 37 cents per dozen for Grade A large, depending upon the season of the year.

British authorities announced early in the war that poultry was to be considered a luxury and its importation prohibited, and, since May 1, 1940, no poultry has been forwarded to Britain. The industry, however, has not suffered because of strong domestic and United States demand.

Tobacco, for which the United Kingdom constituted one of the foremost export markets, has declined by about 35 per cent.

In the field of manufactured farm products, rubber manufactures are included for statistical convenience. Canada is one of the world's largest producers of rubber articles, and boots and shoes in particular were a substantial export to the United Kingdom in pre-war times. These exports have been practically wiped out but rubber hose and rubber tires, for war use, have increased enormously.

Bacon exports to the United Kingdom were increasing before the war and have risen to unprecedented levels under the stimulus of wartime needs.





A typical bit of rangeland with a few Herefords from the herd of a British Columbia ranch
At top:—Cattle ranchers in Canada's West Coast Province of British Columbia drive a herd to
water. Canada's meat production has been enormously expanded to meet the wartime needs in
the United Kingdom of civilians and fighters.



Two lumbermen work in the spruce forests of British Columbia. Canada's forests have contributed greatly to the war needs of the United Nations and will be a big factor in reconstruction in the United Kingdom and other devastated areas.

the United Kingdom Government has not declared its permanent post-war policy. Other things being equal, the markets for Empire and foreign agricultural products will be restricted to the extent that Great Britain attempts to maintain its wartime self-sufficiency either as a measure of agricultural policy or in order to conserve foreign exchange. At the International Food and Agriculture Conference at Hot Springs, the United Kingdom undertook to adopt the kind of agricultural policy that would best suit her abilities and the world's needs. The development of agricultural policy in the United Kingdom is a matter of great consequence to exporters in this country.

MINERALS

Products of mineral origin are normally the second main group of exports to the United Kingdom in peace years. In the main, these consisted of the non-ferrous base metals of which Canada is among the world's greatest producers. The base metal mines are usually situated in areas of little value other than for mining, but, because of the tremendous size of the contingent metallurgical works, their operation has created a prosperity which exercises a profound influence on the general economic development



Logs floated from the forests down streams and rivers to the saw and paper mills, must be towed across lakes and through still waters. They are first grouped into huge rafts by loggers known as "boomer men", who are pictured driving the logs inside booms for this purpose.

CANADA AND THE UNITED KINGDOM

of the country. To this prosperity the United Kingdom market has been a major factor.

In addition to the base metals of which the ores are native to Canada, the aluminum industry, based on using imported raw material and this Dominion's great resources of water power, has expanded greatly during the war. Canada can now produce more aluminum than the entire world output in 1939. Exports to the United Kingdom have increased from somewhere over \$12 millions in 1938 to nearly \$80 millions in 1943.

Included also in products of mineral origin are various manufactured goods of iron and steel. Total exports of iron and steel products to the United Kingdom in 1938 amounted to only \$13 millions. This has jumped to \$235 millions in 1943, the principal items being motor vehicles, guns and rifles, pigs, ingots, blooms and billets, farm implements and machinery.

FOREST ORIGIN

In the products of forest origin, the principal exports to the United Kingdom are lumber and timber of various sorts, and pulp and paper exports. Although substantial, the latter are small in comparison with the enormous amount shipped to the United States. Of great importance in connection with the future of this trade after the war, is recon-

struction and the need for housing. The United Kingdom Government has announced a building programme which calls for the construction of four to five million new homes in the ten to twelve years following the cessation of hostilities. In addition there will be necessary reconditioning of factories, business houses and other buildings. Before the war Great Britain imported all but 10 per cent of her timber consumption. Few of the war-ravaged countries will be able to meet their own needs. Even Finland and the U.S.S.R. may be unable to resume exporting on a large scale for some years because of their domestic requirements. Hence Canada will be in a favourable position to supply a substantial portion of the large imports which will be needed for post-war reconstruction in the United Kingdom.

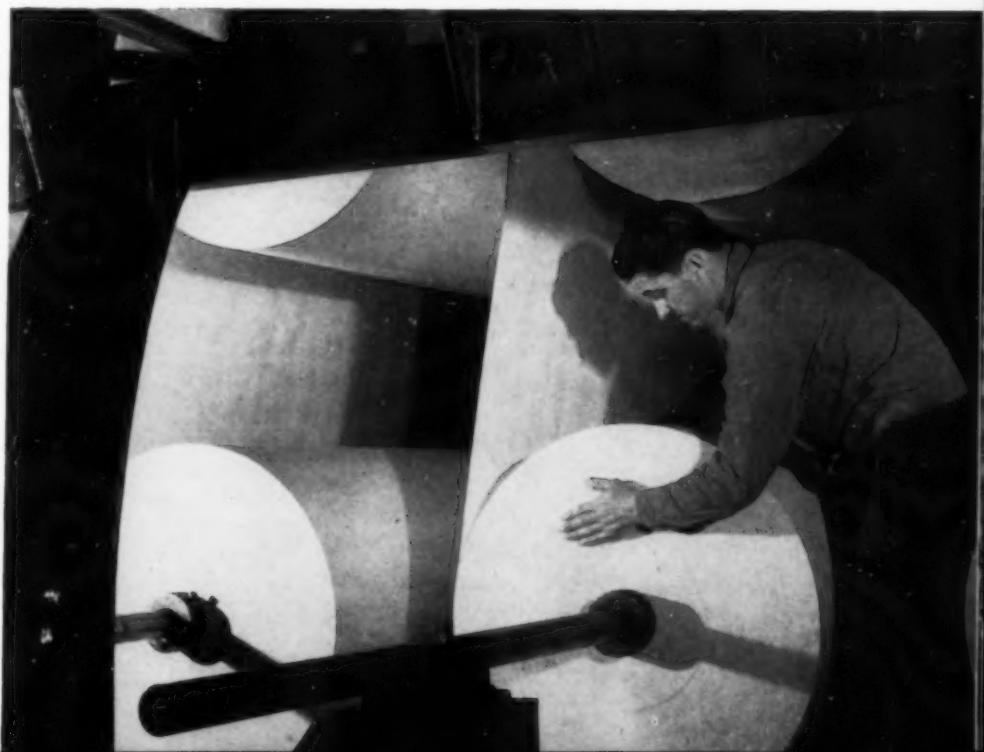
WILD LIFE

Exports under this head comprise mainly furs which are sold at auction in London and in part transhipped to other destinations.

MARINE ORIGIN

Exports of marine origin comprise mainly fish. The principal items before the war were canned salmon and canned lobsters. Under wartime authority imports of canned lobster were prohibited as a luxury but canned

Newsprint in the final stages of manufacture in one of Canada's great pulp and paper mills.





salmon imports, being a staple of the diet of the British public, have increased substantially, exports from Canada in 1938 being valued at \$873,000 and rising to \$11,600,000 in 1943. Between 1941 and 1943 Canada has supplied to the other United Nations, principally the United Kingdom, under wartime plans and agreements, canned salmon, canned herring, canned sardines, frozen fish and salted fish equivalent to more than six hundred million pounds of fish in the fresh state. This far exceeded peacetime exports to these markets.

OTHER EXPORTS

Before the war the principal exports of mixed or indeterminate origin to the United Kingdom comprised films, acids and medicinal preparations. These have been drastically reduced and the increase in the group total is due to enormously expanded exports of war materials including cartridges, aircraft, explosives and drugs.

CANADA'S IMPORTS FROM THE UNITED KINGDOM BY MAIN GROUPS (Calendar Years, 1938 and 1943)

EXPORTS TO THE UNITED KINGDOM OF COMMODITIES
VALUED AT \$1,000,000 OR OVER IN EITHER
1938 OR 1943

(Arranged in order of importance 1938)

Commodities	1938	1943
Wheat	51,666,177	98,314,434
Meats (mainly bacon)	33,809,697	122,331,637
Nickel and manufacturers	27,530,673	6,277,716
Copper and manufacturers	26,123,837	18,703,518
Planks and boards	19,374,453	35,537,756
Aluminum and products	12,198,726	79,738,981
Cheese	11,023,338	25,895,674
Paper and products	9,705,089	4,065,517
Flour of wheat	9,585,603	39,082,010
Platinum and other metals of platinum group	9,023,427	—
Furs and manufactures	8,794,834	66,844
Apples, fresh	8,709,817	654,299
Barley	7,226,843	—
Lead	6,656,476	8,005,482
Zinc	6,571,840	8,212,019
Tobacco	5,235,740	3,428,466

Top to bottom:—Woodpulp from Canada being discharged, Bristol City docks.

Flour barrels in London, England, manufactured from imported Canadian staves.

The luxury liner Queen Mary under construction at Clydebank, Scotland. The timber supporting the hull and many other materials were obtained in Canada.

CANADA AND THE UNITED KINGDOM

Fish, canned:			
Herrings.....	6	4,235,516	
Lobsters.....		—	
Salmon.....	3,194,614	—	
Machinery, except farm.....	3,726,527	11,605,958	
Wood pulp.....	4,324,589	4,277,431	
Cereal foods.....	3,678,448	17,349,975	
Leather, unmanufactured.....	3,489,815	—	
Oatmeal.....	3,358,877	466,332	
Pigs, ingots, etc., iron.....	2,973,480	1,832	
Vegetables, canned (mostly tomatoes).....	2,734,014	19,229,065	
Animals, living.....	2,618,607	13,973	
Oils, fats, greases, etc.....	2,519,808	—	
Processed milk.....	2,155,686	463,618	
Oats.....	2,110,544	155,166	
Canned fruit.....	2,070,940	—	
Films for photographers' use.....	1,881,939	8,906	
Pickles and sauces.....	1,797,615	2,480	
Rolling mill products.....	1,709,376	349	
Asbestos and manufacturers.....	1,613,856	330,545	
Doors of wood.....	1,461,618	2,119,465	
Toilet soap.....	1,341,127	—	
Bran, shorts and middlings.....	1,263,995	127	
Hardware and cutlery.....	1,263,100	—	
Vehicles of iron—	1,232,394	577,514	
Automobiles, freight.....	1,946	77,550,362	
Automobiles, passenger.....	1,118,924	—	
Automobile parts.....	27,388	50,915,597	
Motor vehicles, n.o.p.....	90	26,307,562	
Farm implements.....	1,129,477	5,790,964	
Abrasives, artificial, crude.....	942,170	2,904,424	
Butter.....	726,358	2,940,098	
Veneers and plywoods.....	721,364	11,173,690	
Electric apparatus.....	712,649	6,471,832	
Inorganic chemicals.....	599,135	4,610,738	
Silk, artificial.....	513,895	2,779,976	
Seeds.....	445,770	1,507,127	
Cartridges, gun, rifle or pistol.....	411,869	154,716,328	
Silver bullion.....	309,904	2,129,101	
Hardwood logs.....	304,731	1,383,498	
Shoos.....	244,830	2,558,677	
Aircraft and parts.....	86,713	15,892,949	
Flax fibre and tow.....	85,972	1,732,005	
Cobalt alloys.....	77,583	1,020,977	
Explosives and fulminates.....	58,080	10,509,290	
Carbon and graphite electrodes.....	42,643	2,185,427	
Philosophical and scientific apparatus.....	4,002	1,896,024	
Guns, rifles, etc.....	630	45,993,784	
Fertilizers.....	—	1,390,840	
Vegetables, dried.....	—	1,507,401	
Egg yolk, dried eggs, etc.....	—	14,371,882	
Gifts and donations.....	—	8,671,500	
Army and navy stores.....	—	35,949,759	
TOTAL ABOVE COMMODITIES.....	316,423,668	1,006,014,417	
Per cent of Total Exports.....	93.1	97.5	

THE UNITED KINGDOM AS A SOURCE OF SUPPLY FOR CANADA

While exports are indispensable to Canadian prosperity, imports are also vital. The development of diversified and extensive manufacturing industries in Canada has made it necessary to procure a wide range of materials to supplement domestic resources, and the high standard of living attained by the Canadian people necessitates drawing on foreign sources of supply for a wide range of consumers' goods.

In peacetime Canada normally imported from the United Kingdom about one-fifth of her total imports. Of the main groups textiles and textile products—wool, cotton and the newer textiles in which the manufacturing industries of the United Kingdom excel—was the undisputed leader, contributing more than one-third of the total. The iron and iron products group was second in importance, with rolling mill products and machinery the most valuable items. Whisky and tea contributed substantially to the importance of the vegetable products group; coal to the non-metallic; and various articles of household and personal equipment to the miscellaneous group. The relative importance of the main groups of our imports from the United Kingdom in the year 1938 is shown in the table.

		Per cent
		increase (+)
		decrease (-)
		1943 compared
		1938 1943 with 1938
Agricultural and vegetable products.....		8 million
Animals and animal products.....	4.6	2.6 — 44.8
Fibres, textiles and textile products.....	40.1	56.1 + 39.9
Wood, wood products and paper.....	3.6	1.4 — 60.4
Iron and its products.....	21.6	7.2 — 66.7
Non-ferrous metals and products.....	5.8	5.5 — 5.3
Non-metallic minerals and products.....	13.0	12.4 — 4.6
Chemicals and allied products.....	7.0	5.6 — 19.7
Miscellaneous.....	7.1	39.8 + 459.4
	119.3	135.0 + 13.1

Cod being cured in salt—for overseas shipment.



Cod fishing is almost entirely carried on off Canada's Atlantic Coast, where the value of the 1942 catch was \$5,570,400.

CANADA AND THE UNITED KINGDOM

Early in the war the United Kingdom undertook a strong export drive aimed at obtaining more currency to help pay for greatly increased war supplies and other essential imports. This was not easy since wartime needs compelled the diversion of labour and materials to even more essential uses. Moreover, the loss in quick succession of the Polish, Czechoslovakian, Danish, Norwegian, Netherlands, Belgian, French and Italian markets cut off important export outlets, and the drastic bombing of the British ports had further disastrous effects.

With the development of a totally new concept of war financing represented by lend lease and mutual aid, from the spring of 1941 on, the export drive was replaced by a policy of export restriction which was reinforced by increasing shortages both of raw material and of labour due to the absorption of manpower by the armed forces and the munitions industries. Exports became even more a casualty of war and were permitted only if necessary for war industries or essential civilian activity in the country to which exported.

Taking into account the rise of over 70 per cent in export prices, it is safe to say that by 1943 nearly 75 per cent of Britain's pre-war export trade had been sacrificed to the needs of the war.

Viewing Canada's imports from the United Kingdom against the general background as set out above, it is interesting to note that there was a considerable rise in 1940 and 1941, imports in the latter year being 84 per cent above those of 1938. In 1942 and 1943 considerable declines occurred, although in the latter year imports were still 13 per cent above the 1938 level, owing to higher prices. As a percentage of all Canada's imports, however, those from the United Kingdom declined almost steadily from 17.6 per cent in 1938 to 7.8 per cent in 1943.

Of the nine main groups only two—fibres, textiles and textile products and miscellaneous, showed increases in 1943 as compared with 1938. In the former group, wool and products registered the largest increase in point of value; i.e., \$8.7 millions, or 43.7 per cent. Artificial silk increased by \$6.5 millions, or 347.9 per cent; cotton textiles by \$3.3 millions, or 35.5 per cent. The advance in the "miscellaneous" group was due almost wholly to articles for the army and navy, which increased by \$34 millions, or more than 24,000 per cent.

The largest declines were registered by the iron and products group—\$14.4 millions or 66.7 per cent; vegetable products—\$12 millions or 73.8 per cent; wood and wood products declined \$2.2 millions or 60 per cent;

Herring fishing on Canada's Pacific Coast. Production of canned herring increased from about 80,000 cases in 1938 to over 1,000,000 cases in 1943. Only about ten per cent of the 1943 pack was used in Canada; approximately 90 per cent was sent overseas to help feed the fighters and workers of the United Nations.



animal products—\$2.1 millions or 45 per cent; and chemicals—\$1.4 millions or 20 per cent.

On account of the rise in the prices of United Kingdom exports, the consideration of values alone tends to present a somewhat distorted picture of the war trade trend, magnifying the apparent increases and minimizing the declines.

By 1943 imports of food products from the United Kingdom had practically ceased. Beverages held up better than did tobacco. Whisky, the largest item, declined 47 per cent in quantity and 34 per cent in value, while gin declined 73 per cent in quantity and 59 per cent in value. Crude rubber, castor oil, palm oil and other products originating in the Far East but imported through the United Kingdom, declined 100 per cent.

Imports of woollen textiles, controlled by agreement between the Government of Canada and the United Kingdom, increased from \$20 millions in 1938 to \$30.5 millions in 1940, but by 1943 had declined to \$28.7 millions. Between 1938 and 1943 worsteds and serges showed the greatest absolute increase—\$4.5 millions or 82 per cent in value and 14 per cent in volume. Tweeds increased 41 per cent in volume and 90 per cent in value.

The artificial silk group was the only textile group which showed a continuous rise during the war years, reflecting its use in the manufacture of parachutes, etc. Artificial silk was used to supplement the small supplies of cotton and to help fill the gap created by the cessation of Japanese exports. Artificial silk yarns increased 410 per cent in volume and 877 per cent in value.

Our imports of cotton textiles (the United Kingdom's principal textile export) rose from \$9.4 millions in 1938 to \$15.9 millions in 1942, but with the increasing labour shortage declined to \$12.7 millions in 1943. There were increases in the yarn and thread group and in some lines of woven fabrics. Jute yarns, cord and fabrics decreased drastically.

Iron and its products showed the largest absolute decline and the second largest percentage decline; rolling mill products fell 99 per cent, farm implements 97 per cent and other machinery, 61 per cent. Articles for civilian consumption such as cutlery, razors and razor blades, scissors, and vacuum cleaners, declined practically 100 per cent.

Increases and declines in non-ferrous metals almost counterbalanced, with war need or use as the chief determinant. Of the non-metallic minerals, coal, the only raw material of any importance exported from

CURRENT TRANSACTIONS BETWEEN CANADA AND THE UNITED KINGDOM

(Millions of Canadian Dollars)

	1937	1938	1939	1940	1941	1942	1943
A. CURRENT CREDITS—WITH THE UNITED KINGDOM							
Merchandise exports—after adjustment...	385	337	332	542	914	1,424	1,636
Tourist and travel expenditures.....	11	8	7	5	2	2	1
Interest and dividends.....	2	2	2	2	4	5	4
Freight and shipping.....	38	34	34	60	110	114	128
All other current credits.....	8	8	9	27	63	112	120
Total current credits.....	444	389	384	636	1,093	1,657	1,889
B. CURRENT CREDITS—WITH THE UNITED KINGDOM							
Merchandise imports—after adjustment...	148	119	106	133	137	116	100
Tourist and travel expenditures.....	16	15	11	2	2	2	2
Interest and dividends.....	85	81	78	74	66	50	51
Freight and shipping.....	43	30	36	32	28	41	40
All other current debits.....	17	17	16	52	126	225	547
Total current debits.....	309	262	247	293	359	434	740
C. NET CURRENT BALANCES—WITH THE UNITED KINGDOM							
Merchandise trade—after adjustment.....	+237	+218	+226	+409	+777	+1,308	+1,536
Tourist and travel expenditures.....	—5	—7	—4	+3	—	—	1
Interest and dividends.....	—83	—79	—76	—72	—62	—45	—47
Freight and shipping.....	—5	+4	—2	+28	+82	+73	+88
All other current transactions.....	—9	—9	—7	—25	—63	—113	—427
Total current account.....	+135	+127	+137	+343	+734	+1,223	+1,149

the United Kingdom, fell by almost \$4 millions, or 59 per cent, while the volume declined by 69 per cent.

The rise of 459 per cent in the miscellaneous group was due to the greatly increased import of articles for the army and navy, and cartridges, etc.

THE PAYMENTS PROBLEM

Into the whole fabric of commercial relations the threads of finance are closely interwoven with trade in commodities. Imports and exports are only one item (though usually the most important one) in the total of international transactions. Closely connected with visible or commodity trade are other items, called 'invisible', which play a part in the balancing of all debts due a country with debts due by the country. A summing up of the entire list of commercial and financial transactions which one country has with others is called the 'balance of international payments'.

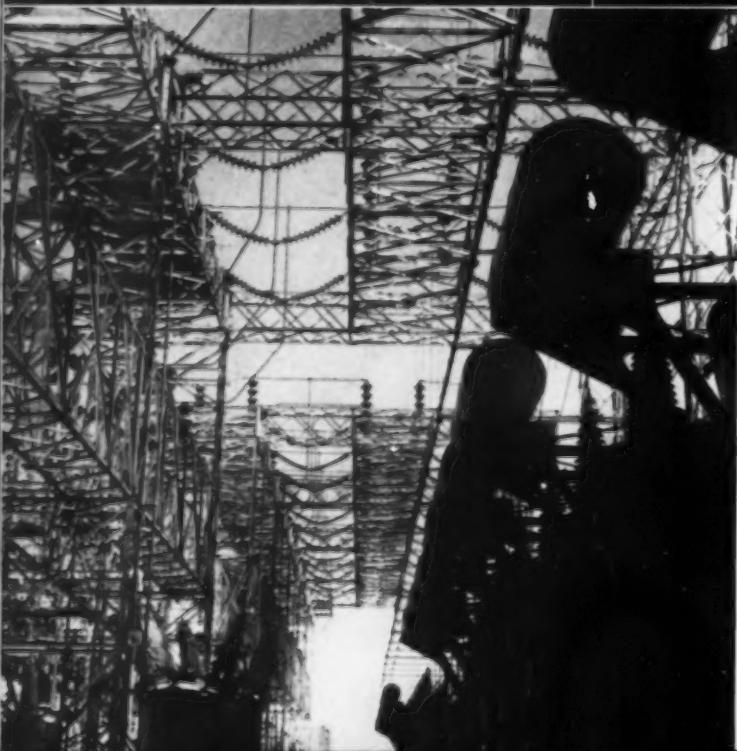
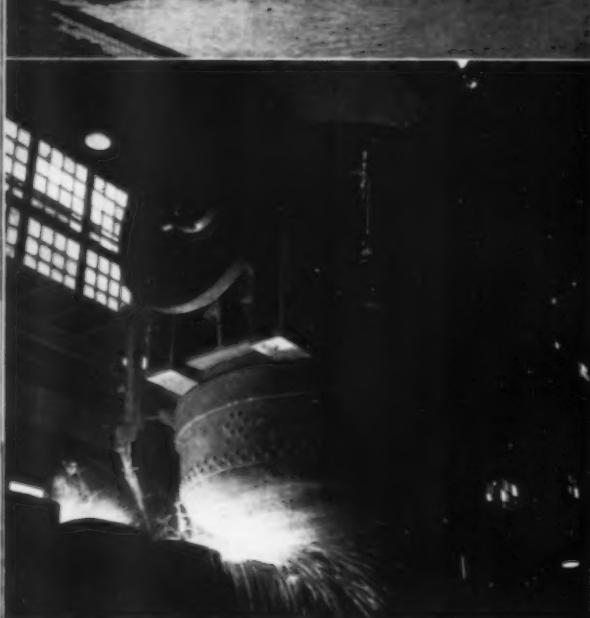
The table left gives the Canadian balance of payments with the United Kingdom on current account for the years 1937 to 1943 inclusive. It will be noted that the payments accruing to Canada with respect to the surplus of exports over imports have been offset to some extent by payments ac-

Orchards in Nova Scotia (top right), British Columbia (bottom left), and Ontario (bottom right); Canada's chief apple-producing provinces. The United Kingdom was the main export market for Canadian apples in peacetime.





Non-ferrous smelter, the largest in the British Commonwealth. Owned by the Consolidated Mining and Smelting Company of Canada, Limited, it produces more than 700 tons of lead daily; also zinc, gold, silver, tin, antimony, bismuth, cadmium, ammonium nitrate and chemical fertilizers.



Above:—Operations at the open-hearth furnaces at the Steel Company of Canada plant, Hamilton, Ontario. Canadian steel production has doubled during the war years, the 1943 production having been 2,996,978 tons.

Centre, left:—Giant electric "pots" at Canada's vast aluminum producing plant at Arvida, Quebec, in which aluminum is freed in liquid form from alumina powder. The ore (bauxite) is not found in Canada but is refined here on account of the country's immense hydro-electric power resources. Canada's capacity to produce aluminum is now greater than that of the entire 1939 world.

Left:—One of the largest users of electrical power in Canada is the great aluminum plant at Arvida, Quebec. Part of the transformer station is shown here.

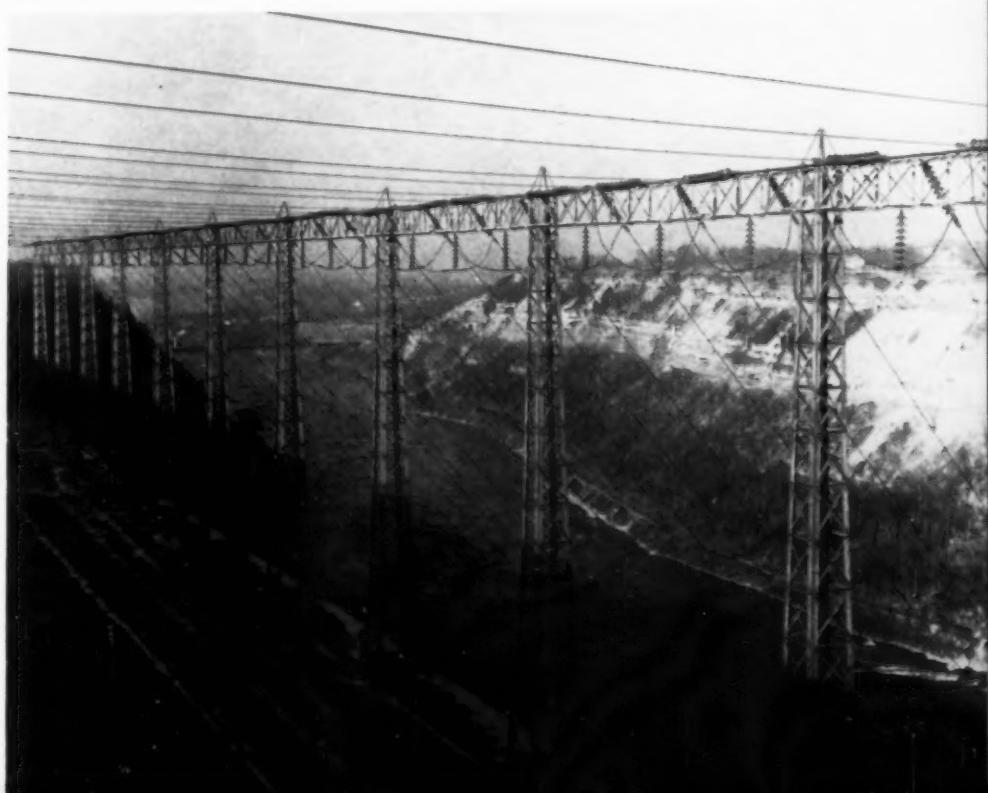
CANADA AND THE UNITED KINGDOM

cruing to the United Kingdom from Canada in respect of other factors. The most important of these were interest and dividends. For many years, mainly prior to the First World War, the development of Canadian enterprise depended heavily upon capital provided by the United Kingdom. In more recent years, the United States, in its newly acquired capacity of a great capital lending nation, became the main source of loans to Canada. It is true occasional loans were floated in Great Britain after 1914, but, as a matter of fact, there is no doubt that the outstanding bonded indebtedness of Canada to the United Kingdom has been considerably reduced. Prior to the outbreak of the war British investments in Canada were roughly estimated in the vicinity of \$2,700,000,000. In his Budget Message of March, 1942, the Honourable J. L. Ilsley, Minister of Finance, disclosed that British investors still held in Canada \$700 millions worth of Canadian dollar securities and \$300 millions worth of sterling securities based on Canadian property and enterprise. At the same time, as will be further indicated below, Canada had become a substantial creditor of the United Kingdom.

The war has greatly changed the balance

of payments position of the United Kingdom. Before the outbreak of hostilities the United Kingdom was a creditor not only of Canada but of most of the rest of the world. At the outbreak of war the United Kingdom was faced with a growing need for imports—imports of foodstuffs to sustain its 49 million people, of raw materials to expand the output of its factories, and imports of manufactured products and of munitions of war. These imports had to be financed. In the early part of the war it was attempted to do this by expanding exports and by liquidating foreign investments abroad. It was soon realized that the expansion of exports was only a limited solution, partly because increased exports necessarily involved increased imports of raw materials and because the extension of Nazi domination progressively eliminated available markets. As to the liquidation of foreign investments, it soon became clear that these would not suffice even if they could be disposed of entirely, and many securities were of such a character that it was not possible to realize on them. In these circumstances a number of wartime expedients had to be developed. These included the inauguration of Lend-Lease by the United States and the build-

The waters of the Niagara River, shown here just after having cascaded over the famous Niagara Falls, are one of Canada's important sources of power. Canada's supply of electrical energy — the "white gold" that turns the wheels of more than 80 per cent of the nation's industry — has proved to be one of the most important reasons why Canada now holds fourth place among the United Nations as producer of the supplies of war.





CHINAWARE
AND
POTTERY

England is famous throughout the world for the design and quality of its high-class bone china, semi-porcelain and earthenware pottery. Canada is one of England's most valuable export markets, and the products of the firm, whose newly constructed head office is here illustrated, need no introduction to Canadian or American users.



ing up of large credits in London by a number of Empire countries. Insofar as Canada and the United Kingdom are concerned, the problem of finding means to finance the growing British shortage of Canadian dollars resulting from the extraordinary wartime needs of the United Kingdom for Canadian food and munitions was met briefly as follows. In the earlier years of the war this shortage was met by the Canadian Government taking over Canadian securities owned in the United Kingdom and by the acceptance of payments deposited to the account of the Canadian Foreign Exchange Board in London. Some payments have also been

made by sales of gold from the United Kingdom which were, in turn, transferred to the United States to settle Canadian deficits there. In 1942, however, a new method of meeting the growing needs of the United Kingdom was introduced when a gift of one billion dollars was made to the United Kingdom by the Canadian Government to be spent on war supplies in Canada. The following year a further development was the appropriation by the Canadian Parliament of one billion dollars for mutual aid, to be used to finance the wartime needs of the Allied Nations for Canadian supplies. Expenditures which Canada makes overseas in connection with the Dominion's armed forces abroad have provided the United Kingdom with a further supply of Canadian exchange which is also available to pay for goods purchased in Canada. Finally, the United Kingdom has had special receipts of Canadian dollars in 1943 arising through the repatriation by Canada of the British equity in the fixed capital of war plants in Canada, amounting to \$205 millions. There were also large receipts from the return of working capital funds formerly advanced.

It has only been because of special receipts of Canadian dollars, such as mentioned above, that the United Kingdom has

Above:—Though the export of furnishing fabrics has had to be discontinued during the war, Britain's designers have not been idle, and the illustration shows some sample lengths of new patterns recently displayed to the trade. These cannot yet be placed upon the market, but export will be resumed as soon as the more urgent demands for textile fabrics for essential purposes have been satisfied.

There is nothing to equal the quality and style of Scotch tweed, and it is in demand wherever an appreciation of real excellence is to be found. During the war the production of such luxury articles has had to be greatly curtailed because the plant facilities were needed for more urgent work. With peace will come a return to normal output, for the industry earns valuable dollars for Britain.





Coal is Britain's most valuable natural resource and it is the basis of important gas, oil, tar, chemical and plastic industries. Much new research into the uses of coal and its constituent elements has been carried out during the war, and the results of this work will be exploited commercially as soon as men and materials can be released from the production of essential war supplies.

been able to continue to make large purchases in Canada, since the more normal payments by Canada, such as those for imports from the United Kingdom and the sterling area, or payments of interest and dividends to British investors, are small in relation to the heavy purchases which Britain is making in Canada during the war and for which Britain must have Canadian funds.

All of the special sources of dollars which have made these purchases possible are Dominion Government expenditures and are accordingly part of the wartime financial organization in which government expenditures represent a large proportion of the national income.

The changed position as a creditor nation

in which the United Kingdom will find herself after the war will have an important significance for Canadian post-war trading possibilities. Before the war, the United Kingdom was able to finance about one-fifth of her total imports by means of funds accruing from her great investments throughout the world. In addition, that country performed many ancillary services for the rest of the world. In 1938, the credit income from overseas investments, shipping and other services, paid for more than one-third of all the retained imports of foods and materials. It is clear that after the war this investment income will be seriously curtailed. Even if there is no further depreciation, it has been estimated that it will be reduced to about half the £200,000,000 sterling realized before

CANADA AND THE UNITED KINGDOM

the war. In addition, incomes from shipping will be also curtailed until the merchant marine can be rebuilt.

Canadian exports to the United Kingdom and, consequently, the possibility for full Canadian prosperity, will suffer if the United Kingdom is unable to secure the foreign exchange necessary to pay for imports. Not only is the United Kingdom market important for the maintenance of employment and prosperity for Canada's agricultural and other export industries, but the credits ensuing from the Dominion's surplus of exports in this market were normally an important factor in providing funds to meet deficits elsewhere, notably the United States. Moreover, many of the other countries with

which Canada had favourable balances of trade before the war had themselves favourable balances of trade with the United Kingdom. It therefore followed that most of the funds in payment for Canada's favourable merchandise trade balances originated in the United Kingdom. For the first period of transition after the war, the situation can be relieved by the resumption of international lending on an adequate scale. To this end, the proposals put forward by the experts at Bretton Woods for the establishment of a bank for reconstruction and development are of great significance. At the same time, the Export Credits Insurance Act passed by the House of Commons in August, 1944, is an important measure in

"Sheffield" is synonymous with steel of the highest quality, though of course steel is produced in many other centres in the United Kingdom. Production facilities have been much expanded and modernized during the past few years, and plans have been made for the installation of much new plant after the war. The steel industry of the country will play an increasingly important part in the development of Britain's export trade.





The fen country of England, with its many similarities to Holland, has become the home of a thriving bulb industry, and the picture shows a typical field of bulbs on the outskirts of the village of Pinchbeck in Lincolnshire. Canada is an important importer of bulbs from Britain, and a development of this trade is confidently expected after the war.

support of post-war exports from Canada.

The provision of international loans, however, does not constitute a permanent or complete solution. Eventually the loans will need to be repaid, and if the United Kingdom is going to continue to import on a scale equal to or exceeding pre-war levels, a larger proportion than formerly will have to be paid for by exports. It has been estimated that a target of from 50 to 75 per cent above peacetime levels should be the objective of policy.

A restriction of imports into the United Kingdom to the levels that could be paid for otherwise would undoubtedly result in reduced standards of living in Great Britain. It is therefore very much in both Britain's

and Canada's interest that the world should have an expanding international commerce after the war. In an expanding world trade many of the obstacles which now loom large would be relatively less important.

Doubts have been expressed as to the ability of the United Kingdom to increase exports to the levels mentioned, for this necessarily involves a great increase in the import of raw materials. It may be reasonably anticipated, however, that Britain's heavy buying of such materials will itself do much to create purchasing power among the primary producers, and this will undoubtedly react to her benefit. United Kingdom export industries have always depended for their success upon their ability to im-

CANADA AND THE UNITED KINGDOM

port raw materials at world prices and to export their manufacturing skill in the form of highly finished products. The British people have amply demonstrated by the record of their wartime output that they have lost none of their skill and capacity, and it must always be remembered that they possess a great asset in their knowledge and experience of export trading which has not been dissipated by the war.

One final point must be considered, i.e., how much can Canada's imports from the United Kingdom be increased to contribute to the solution of this problem? Unfortunately, Canada's principal import needs are not such as the United Kingdom is pre-eminently fitted to supply. Of the fifteen or sixteen leading imports into Canada in normal times, only coal and machinery are of this type and, with respect to coal, the United Kingdom supply possibilities in the immediate pre-war period are at least somewhat dubious. Nevertheless, greater prosperity in Canada, with resulting greater imports, will create markets for a wide

variety of United Kingdom goods which, in the aggregate, may be considerable. The Honourable James A. MacKinnon, Minister of Trade and Commerce, speaking on this subject, said recently: "One of the greatest single questions that Canada has to face is that of determining how and to what extent Britain's Canadian dollar position can be strengthened. It seems as clear as the handwriting on the wall that our exports to the British market must depend, as never before, upon the size of the dollar fund which Britain obtains through the sale of British goods in Canada."

Increased prosperity throughout the world, in which Canada participates, will mean increased imports from the United Kingdom and from countries which, in turn, will be large markets for United Kingdom goods. We are thus led to the belief that the commercial relations between Canada and the United Kingdom will best be served by an expanding world trade and the development of trading institutions which will foster world commerce on a multilateral basis.

While some plants still in operation in Britain date from the early days of the industrial era, many new factories have been erected in recent years which are the equal of those to be found anywhere. The building shown in this illustration is typical of the new Britain and of the reconstructed plants which will arise on the blitzed ruins of the old.





Left:—Fruit and Vegetable Products Building, Horticultural Division, Central Experimental Farm, Ottawa



Above:—The pre-processing room of the Fruit and Vegetable Products Laboratory, Ottawa

Below:—Test kitchen, Fruit and Vegetable Products Laboratory, Ottawa, where commercial samples of dried foods from all over Canada are tested and graded and where experimental lots are given their evaluation.



Above:—Experiments with loading, gassing and packaging equipment in the Laboratory, Ottawa

Canadian Dehydrated Fruits and Vegetables

by M. B. DAVIS

FOR OVER thirty years Canadians have been accustomed to seeing boxes of dried apples offered for sale in the corner grocery. This product had never obtained in Canada a very wide consumer acceptance since the colour and general quality did not make the necessary appeal to Mrs. Housewife. Probably few of us realized, however, that Canada was regularly producing about four million pounds of dried apples, mostly for export to European countries.

Dehydrated Fruits

Although Canadian dried apples have been, to date, the only commercially important fruit in her dehydration industry, Canada has produced small amounts of dehydrated loganberries, apricots, prunes, and, in recent years, peaches. In 1944, a dehydration plant was constructed in the Lake St. John region with the purpose of dehydrating blueberries, and this product will undoubtedly be offered to the public in the present year. In addition, renewed interest is being indicated by one or two concerns in the dehydration of peaches and cherries, both in Eastern and Western Canada, and it is fully expected that even raspberries will be added to the list of dehydrated fruits made available to the Canadian public. All the products mentioned above are first class, and will undoubtedly have consumer appeal. The limiting factor, for some few years, may be the quantities of fresh fruit available; as the fresh fruit trade and canning industry make heavy demands on supplies of the primary products, there is very little left over for processing in the dehydrated form. The blueberry situation, however, is somewhat different, and it is fully expected that dehydration of this product will make rapid strides in the immediate future.

With the advent of war and the conse-

quent shortage of shipping space, it became essential to process a large part of our apple crop rather than have it go to waste. All the canning and dehydration plants in the fruit areas were put to work to salvage this crop, and the resulting product was shipped to England. It was realized at the outset that much could be done to improve the quality of the dehydrated product, and, since this large-scale production was under government control, it presented an opportunity for just that. Thus there developed a concentrated effort to apply the findings of past investigations to improve colour, grading, uniformity of moisture, removal of seed cell, and control over the actual removal of moisture. A very marked improvement in quality resulted; so marked that our customers abroad began asking for more and more of Canada's dried apples and for less and less of her canned product. Not only that, but the Canadian consumer began to appreciate this improved quality and soon used up his quota and called for more. To-day Canada is producing upwards of twelve million pounds of dried apples of the highest quality.

This development in dried apples is an interesting story of progress covering a period of over fifty years, during twenty-five of which government agencies have carried on research. The first dried apples were the sliced rings strung behind the kitchen stove to become flavoured with tobacco smoke and the general odours of the farm kitchen. This produced a pretty sorry-looking commodity that bore but slight resemblance to the fresh fruit. Subsequently, the drying of apples progressed to the use of evaporators or kilns which consisted of a two-story structure with a slatted floor on which sliced apples were piled a couple of feet deep. Beneath this



floor were large stoves and in the roof was a ventilator. By the forcing of the hot air from the stoves up through the pile of apples and out the ventilators, the product was dried to about 25 per cent moisture. The burning of sulphur prevented excess discoloration, and a fairly acceptable product was manufactured. The method was crude and costly in fuel consumption. The control of temperature and drying conditions was difficult and uniformity of the product was lacking.

From here investigations took the product to the tunnel drier, which first consisted of a long tunnel with a high speed fan to cir-

culate heated air over the product which was loaded on trays and carried on trucks through the tunnel. This improvement permitted of better temperature and humidity control, cut fuel costs and drying time, and generally improved the resultant product. Later, two-stage drying was adopted so that the product received part treatment in one tunnel and then passed to a second. This added refinement made it possible to condition the drying air to suit the product at varying stages. Thus, at the start, when the fruit is full of moisture, it may be safely subjected to temperatures as high as 180 to 190°F. because the rapid evaporation of water from the product keeps the fruit quite cool. When the product has lost an appreciable amount of its moisture, however, water loss becomes slower and the product begins to rise in temperature so that it becomes necessary to drop the temperature continually as drying proceeds and to use drier air as a vehicle for moisture removal. The principles of physics and engineering involved have taken a great deal of unravelling in order to obtain uniform humidity conditions—all under very accurate and automatic control. Fortunately, this had all been worked out prior to the advent of World War II so that Canada was in a good position to adapt herself to war requirements when the call came.

Top left:—All modern plants operate their own central laboratories and test kitchens.

Courtesy Bulmans Ltd.

Left:—The washing and paring of potatoes in a New Brunswick plant

Courtesy Pirie Potato Products, Grand Falls, N.B.

Below:—The trimming table where all remaining blemishes are removed. In the background are shredded potatoes on elevator.

Courtesy Pirie Potato Products





A modern dehydration plant in British Columbia

Courtesy Bulmans Ltd., Vernon, B.C.

Dehydrated Vegetables

Whilst dehydrated fruits have been a widely used commercial commodity for generations, not so dried vegetables. Fruits possess considerable sugar and acids so that, when the water is removed, the dried product has a reasonably long life. Vegetables are different; most of them are non-acid and contain a very small amount of sugar, and the keeping of the dried product is therefore a far more difficult proposition. During the United States Civil War, dried vegetables were employed in the rations of the Northern troops, but after the war no one wanted even to hear of dried vegetables. Then again, during World War I, the industry was revived, and thousands of tons were produced in Canada and the United States—practically all in the crude apple kilns. At that time dietitians knew little, and cared less, about *vitamins*. Nor did they pay much attention to appearance and palatability. Dry matter and caloric value were their only considerations . . . it mattered little that the dried vegetables which were produced looked like the top of your old felt hat and tasted like hay. Consequently, no returned man wanted dried vegetables at any price—and there the matter rested until a few years before the present war.

Theoretically, there was no reason why the drying of vegetables should not produce a first-class product. If you could get them dry enough they ought to keep. A vegetable product devoid of all its moisture does not offer a good field for spoilage, and so three

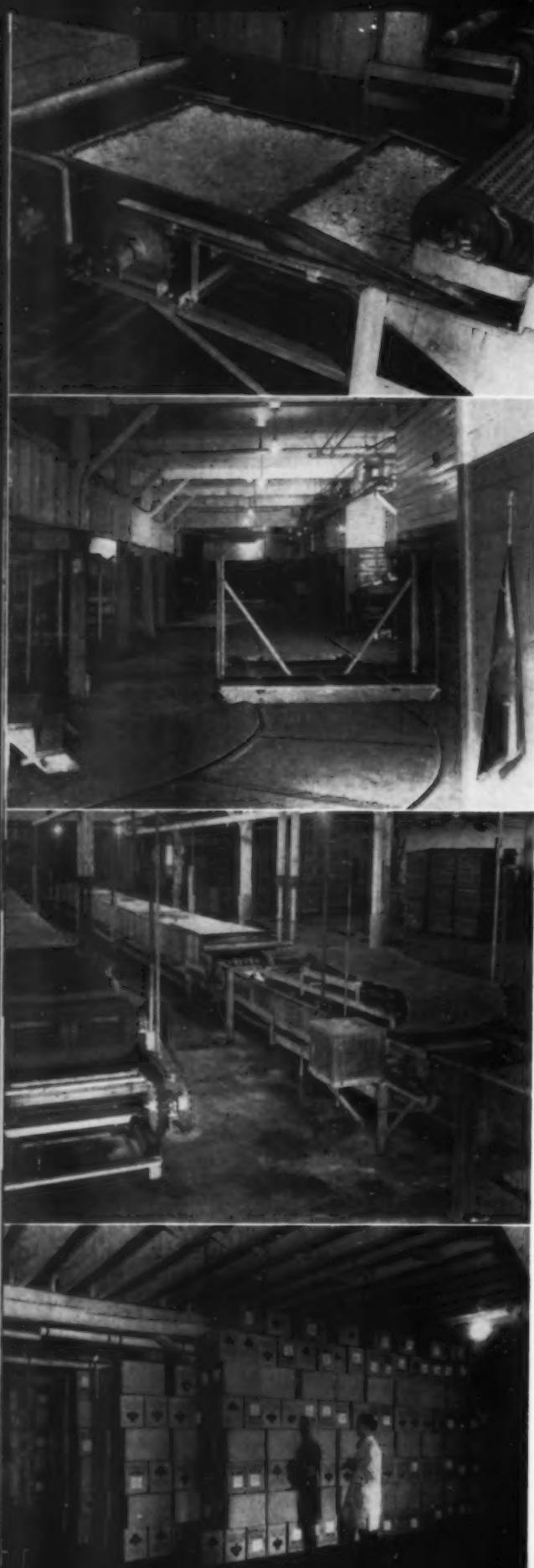
of Canada's dehydration plants continued to play with the dried vegetable proposition in a small way. In the first place, they improved their product by using the dehydration tunnel which cut their drying time and enabled them to control their drying temperatures. Their products were improved quite markedly, and, if not kept too long, bore a fair resemblance to the fresh vegetable. In 1938, in anticipation of a possible war, the Canadian Government, in co-operation with the British Admiralty, arranged for a round-the-world shipment of Canadian dried vegetables. This shipment left Canada for England, where a portion was retained; the rest went on its way, with portions being retained at Gibraltar and Singapore, and the balance came back to Ottawa for examination. Certain facts emerged from this test:

1. Canada's dried vegetables were given a good ranking.
2. Despite this, there was much to be desired; they did not keep very long, especially at high temperatures. Further research work was needed if the product was to be a factor in modern food supply.



Right:—Sanitation and good working conditions are essential to modern production. Rest room and cafeteria in a New Brunswick plant

Courtesy New Brunswick Potato Products, Hartland, N.B.



The research required lagged until after the war started, when the English came over to exchange information with Canada and the United States. Their interest and demands gave rise to a concentrated effort in Canada to supply the answers that were missing.

It was known that cooked vegetables kept better when dried than did the uncooked; that fully cooked vegetables were not as palatable as partially cooked; that some lots from the same dehydrator kept better than others. The few Canadian experts and the English representatives went to work: telegraph wires and bomber mails between England and Ottawa were kept busy with questions and answers, and a plan of attack was quickly arranged. The Canadian dehydrator equipment was accepted as sound in design, so that very little effort was needed there to add the few improvements necessary. The problem seemed to lie in the pre-treatment of the product and in the packaging. It was expeditiously tackled and overcome, the solution having entailed the designing of a continuous blancher or pre-cooker; methods for determining enzyme inactivation; a method for rapid moisture determination; a quicker method for sulphur determination; sulphuring equipment; gas packing equipment and a method for making a quick gas analysis. Schools for training plant operators and schools for inspectors were held. As a result of these developments, Canada is to-day packing 95 per cent top grade stuff. Quality in terms of palatability, eye appeal and food value has been the goal, and toward this end over 6,000 samples have been stored at 32°, 65°, 80° and 100° F. with frequent examinations, vitamin assays and cooking tests to determine the best processing and packaging methods to be adopted. Canadian experts have been consulted by every one of the British Dominions during the last three years, and many Canadian designs and techniques have been adopted.

Left, top to bottom:—

Here prepared onions are shown loaded on trays.
Courtesy Bulmans Ltd.

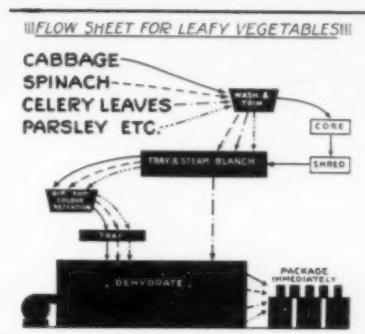
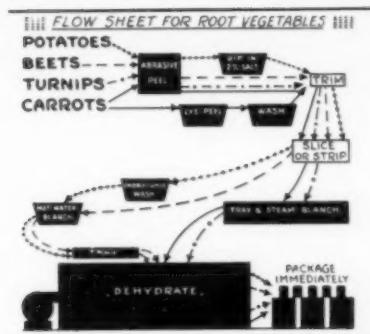
Interior of a modern dehydration plant showing a steam blancher at the left and the dehydrating tunnel at the end.

Courtesy Grahams Dried Foods Ltd., Belleville, Ontario

Canadian-designed and built continuous sulphuring and pre-cooking or blanching equipment
Courtesy Bulmans Ltd.

All packed and ready for shipment abroad.

Courtesy Grahams Dried Foods Ltd.



by them. To-day Canada has 31 dehydrating plants for fruits and vegetables: 15 in Nova Scotia, two in New Brunswick, one in Prince Edward Island, one in Quebec, five in Ontario, one in Manitoba, one in Alberta and five in British Columbia. Our production of dehydrated commodities now runs to over twenty-four million pounds—over six times our normal output.

Now what of the quality of these products? Numerous large-scale trials or panels have been unable to detect the difference between the cooked dehydrated product and the fresh. In the case of cabbage, over 80 per cent of the vitamin C is retained and the refreshed product is fully the equal of the best fresh cabbage; with carrots practically all of the carotene (vitamin A) is retained; with potatoes 60 per cent of the vitamin C is retained and all of the B₁, except when sulphured for hot climates to retain the colour, when about 50 per cent is lost. One could go on, product by product, and the story would be the same. The products are packaged in air-tight five-gallon tins, and (with the exception of potatoes, beets and onions) they are packed in either pure nitrogen or carbon dioxide to prolong their life. How long will they keep? That depends upon temperature to some extent. In climates such as we have in Canada these products will retain high palatability and food values as follows:

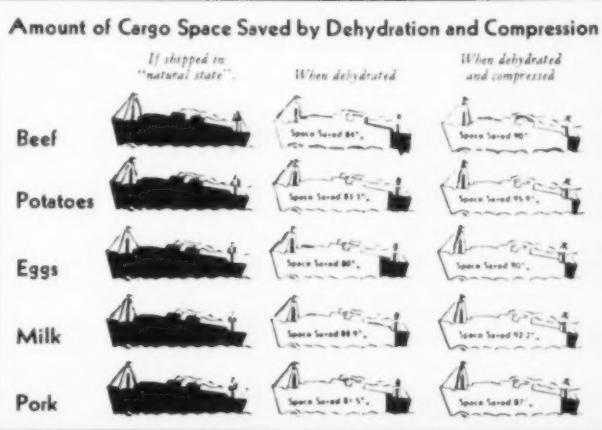
Cabbage for 14 months, Turnips for 10 months,
Potatoes for 10 months, Beets for 24 months,
Carrots for 14 months, Onions for 12 months.

The saving in shipping space can be appreciated when one considers that:

One lb. dried cabbage equals 18 lbs. fresh,
One lb. dried carrots equals 12 lbs. fresh,
One lb. dried turnips equals 12 lbs. fresh,
One lb. dried potatoes equals 8 lbs. fresh,
One lb. dried spinach equals 20 lbs. fresh,
One lb. dried onion equals 16 lbs. fresh.

What of the future? During 1943-44 (and it is expected, 1945) Canada's dried fruit and vegetable industry has manufactured annually 24,000,000 pounds of dried products—equivalent to 136,000,000 pounds of fresh. This will make 50,000,000 apple pies and 106,000,000 servings of vegetables. The industry employs some 8,000 people during the processing season, and the product represents \$7,500,000 in value.

How much of this present-day development can be permanently retained? Dehydrated apples are here to stay and people will like them. The dried vegetable, however, is another matter. Packaging for consumer consumption is a problem; to pack a five-gallon air-tight tin with an atmosphere of nitrogen is one thing, but to pack a six-ounce tin, and do it economically for household use is another. To-day this problem is receiving the attention of manufacturers and the Federal Government. After the war, we may expect to see high quality Canadian dehydrated vegetables on the grocery shelves—and a product which for over eighty years has remained a war baby will have blossomed into full manhood and taken its rightful place among Canada's food industries.



This chart, courtesy of "The Laboratory", house-organ of Fisher Scientific Co., shows that saving the cargo space of a ship is equivalent to providing an additional ship.

David Thompson,

A Great Land Geographer

by LAWRENCE J. BURPEE

MOST OF THE EXPLORERS of the interior of Canada were French or Scots. One of the greatest of them, however, was born in England of Welsh parents. David Thompson, like Alexander Mackenzie, Simon Fraser and Robert Campbell, was a fur-trader. Fur-trading was his occupation, the job that paid for bread and butter; but exploration was his passion. He could never be happy with something unknown lying beyond his horizon; he must go and find it. And, unlike many other discoverers, having seen it, he must put it on the map, and do it with such care that no one could come along later and charge him with careless workmanship. J. B. Tyrrell, who has done more than any one else to give Thompson his rightful place in history, has said of him that "he was the greatest practical land geographer that the world has produced".

David Thompson was born in 1770, he entered the service of the Hudson's Bay Company in 1784, he left it for the North West Company in 1797, he retired from the fur trade in 1812, between 1816 and 1826 he helped to survey the international boundary, and he died in 1857. That is the mere wooden frame. Inside it is the picture of a very remarkable man, an odd-looking little person, in appearance something like John Bunyan, quiet, modest, pious, unassuming, but with a shrewd knowledge of human nature, an unbending will that surprised some of his associates, and a real sense of humour.

Of his innumerable journeys, his important discoveries, his famous manuscript map, there is not room to say anything here, but out of a lifetime of experience in what is now Western Canada, one incident may be taken as typical of the character of the man:

In the course of his travels he had met

and conceived a strong liking for a noble Piegan (Blackfoot) chief named Kootanae Appee, and Kootanae Appee returned the feeling. He was the War Chief of his branch of the great confederacy, and a wily Indian politician named Sakatow was the Civil Chief. Kootanae Appee was popular, and Sakatow envied him his popularity. He thought he saw a chance of toppling the idol off its pedestal. He of course knew of the friendship between the Chief and Thompson. Thompson had built a trading post across the Rockies, in the land of the Kootenays, bitter enemies of the Piegans. Sakatow called a meeting of the tribe, made an impassioned oration denouncing the Kootenays and the traders, urged the warriors to destroy the trading post, and demanded that Kootanae Appee as War Chief lead the war party.

Kootanae Appee saw through the plot, but knew that he could not avoid the responsibility. He led his warriors through the mountains and sent scouts to see what was happening at Kootenay House, trusting to the shrewdness of his friend to find a way out of the difficulty. David Thompson tells the rest of the story in his *Narrative*:

"I showed them all around the place, and they staid that night. I plainly saw that a War Party was again formed, and I prepared Presents to avert it. The next morning two Kootanae Men arrived. Their eyes glared on the Peagans like Tigers. This was most fortunate. I told them to sit down and smoke. I then called the two Peagans out, and enquired of them which way they intended

to return. They pointed to the northward.

"I then told them to go to Kootanae Appee and his War Party, who were only a day's journey from us, and delivering to them the presents I had made up, told them to be off directly as I could not protect them; for you know (he said) you are on these lands as enemies. The Presents were six feet of Tobacco to the Chief, to be smoked among them, three feet with a fine pipe of red porphyry and an ornamented pipe stem; eighteen inches to each of the three Chiefs; and a small piece to each of themselves; and telling them they had no right to be in the Kootanae Country, to haste away, for the Kootanaes would soon be here, and they will fight for their trading Post.

"In all that regarded the Peagans I chanced to be right; it was all guess work. Intimately acquainted with the Indians, the Country and the Seasons, I argued and acted upon probabilities. I was afterwards informed that the two Peagans went direct to the camp of the War Party, delivered the Presents and the Message and sat down. Upon which the War Chief exclaimed, what can we do with this man; our women cannot mend a pair of shoes but he sees them, alluding to my Astronomical Observations. Then in a thoughtful mood he laid the pipe and stem, with the several pieces of Tobacco on the ground, and said, what is to be done with these? If we proceed, nothing of what is before us can be accepted. (Indian honour made it impossible to accept a present and attack the giver.)

"The eldest of the three Chiefs, wistfully eyeing the Tobacco, of which they had none; at length he said. You all know me, who I am, and what I am. I have attacked Tents, my knife could cut through them, and our enemies had no defence against us, and I am ready to do it again; but to go and fight against Logs of Wood that a Ball cannot go through, and with people we cannot see, and with whom we are at peace, is what I am averse to. I go no further.

"He then cut the end of the Tobacco, filled the red pipe, fitted the stem, and handed it to Kootanae Appee, saying, it was

not you that brought us here, but the foolish Sakatow, who himself never goes to War. They all smoked, took the Tobacco, and returned, very much to the satisfaction of Kootanae Appee, my steady friend. Thus by the mercy of good Providence I averted this danger."

Among Thompson's many achievements was the exploration and survey of the Columbia River from its source to its mouth, a survey that even to-day remains the most complete and accurate that has ever been made of that great stream. The American scholar, Elliott Coues, said of Thompson some years ago: "The world can never be allowed to forget the discoverer of the sources of the Columbia, the first white man who ever voyaged on the upper reaches and main upper tributaries of that mighty river, the pathfinder of more than one way across the Continental Divide from Saskatchewan to Columbia waters, the greatest geographer of his day in British America, and the maker of what was by far its greatest map".

In addition to his work on the Columbia and its tributaries, Thompson explored or surveyed a large part of what to-day is included in the four western provinces of Canada and the northwestern states of the United States, including the source of the Mississippi, an overland route from the Assiniboine to the Missouri, the Saskatchewan River to the sources of both its branches in the Rocky Mountains, the Churchill River down to Hudson Bay, Lake Athabaska, the Athabaska River, Great Slave Lake and Reindeer Lake. And it was mainly from Thompson that the eminent map-maker, Bartholomew of Edinburgh, got the material for his maps of Western Canada, or what is now Western Canada.

For more detailed information on David Thompson and what he accomplished, see *David Thompson's Narrative*, edited by J. B. Tyrrell, Champlain Society, Toronto, 1916; *David Thompson the Explorer*, by C. N. Cochrane, Toronto, 1924; *By Star and Compass*, by W. S. Wallace, Toronto, 1922; and *The Discovery of Canada*, by L. J. Burpee, Toronto, 1945.



A section of Hamilton from the mountain to the bay. The Canadian Pacific is in the foreground with light industries such as Mercury textile mills and Wagstaffe's jams on the Iroquois terrace. North of these are representative homes of the employees, grading down to the more congested buildings of the Ontario plain, where the better drained parts are occupied by workers' homes and the Scott Park Stadium. Along the north shore, in contact with railway, road and lake traffic, are the heavy industries, dominated by the Steel Company of Canada.

Courtesy Hamilton Chamber of Commerce

Hamilton and its Environs

by J. W. WATSON

GEOPGRAPHY begins and ends with the neighbourhood. What it is like, how it functions and the way in which it influences the inhabitants—these are all basic geographical considerations. To answer such questions, comparisons have to be made with other neighbourhoods, contrasts are disclosed, and the locality is set in an ever-widening region that leads ultimately to a description of the whole earth. From this position, geography is, in turn, brought back to the neighbourhood, to test its views of the world in the laboratory of the immediate situation, and to see if the general relationships between place, work and folk are in all cases true.

Edouard Montpetit has expressed these relationships very well in his essay, "Le Milieu", where he states: "The habitat influences man, who, by constant adapta-

tions, transforms or dominates the environment. In a way, the environment produces a succession of environments: thus, the natural environment calls forth an economic one, and this in turn evolves a social environment if not an artistic and a literary one." It is to illustrate this geographical succession within the neighbourhood that this study of Hamilton is presented, with the hope that it will further the surveys of urban communities begun by Prof. Taylor, and continued by Robinson, Falardeau and others.

In its very origins, Hamilton is a product of geography, emerging into history as a major land link between the two greatest corridors of migration in eastern North America, namely, the St. Lawrence and Mohawk valleys. (Fig. 1.) These two routes thrust in from the ocean gates at the Atlantic across the uplands of the East, to lead the

HAMILTON AND ITS ENVIRONS



Fig. 1.—The situation of Hamilton, the continental setting

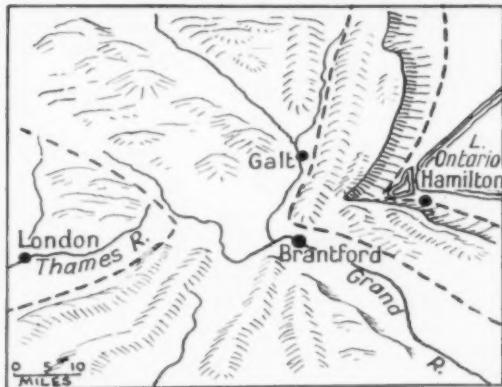


Fig. 2.—The situation of Hamilton, the regional setting

immigrant toward the vast interior plains of the continent. Starting from the outstanding gateways of Montreal and New York, they avoid the Canadian Shield and the Appalachians, and guide routeways and settlement to the half-way junctions of Buffalo and Toronto. Here other corridors meet them from north and south of the Great Lakes and also from the mining areas of Ontario and Pennsylvania. Thence the routes converge on the continental gateway of Detroit, and the expanses of the West.

Between these major east-west lines there are three important links, occurring at Kingston, Hamilton and London. But of these links Hamilton is the most important, because it is associated with major north-south movements, as well as with the interior or oceanic ones. That is, it possesses an easier access to a wider range of resources, economies and societies. As long as the east-west movements are greater than the north-south ones, however, it will always be bypassed by Toronto and Buffalo, which continue to be the main regional junctions.

The subsequent evolution of the city and its present form continue to be influenced by these wider geographical controls, but also respond, in a highly significant way, to factors of the local site. For example, Hamilton is built where the north and south

shores of Lake Ontario converge upon the peninsula of Western Ontario. A remarkable series of topographical units thus come into proximity, including, in addition to the coastal plains, the two great arms of the Niagara escarpment, the upper and lower valleys of the Grand River, the approaches of the Thames valley, and the interfluvial uplands and plains of the Niagara Peninsula. (Fig. 2.) No centre in the province, outside Toronto, commands so many openings, and this has undoubtedly helped to lay the foundations of its commercial development.

The form of the city has reacted to still more local factors, such as the constriction of the escarpment, the unequal growth of the coastal plain, the entrance of the Dundas valley, and the presence of two bay bars to span the waters of the lake. The constriction of the escarpment, as the northern limb approaches the southern one, has held the settlement in a vice, compelling it to expand laterally, along the mountain front, instead of radially, like most other cities.



Looking northwest across Hamilton up the Dundas valley. The road descends from the southern escarpment to the business section, with the outstanding buildings like the Medical Arts, the C.P.R. station, the Pigott office block, Robinson's multiple store and the Royal Connaught Hotel clustered about the principal streets at the foot of the scarp and in the centre of the Iroquois terrace. In the distance may be seen the high-level bridge and the northern escarpment bounding the bay. Beyond the Cathedral in the centre distance lie the residential suburbs of the west end.

Courtesy Hamilton Chamber of Commerce



Gore Park and the centre of Hamilton. Hotels, theatres, shops, offices and restaurants crowd the intersections of John and James Streets, coming down the mountain, with King Street running along the centre of the Iroquois plain.
Courtesy Hamilton Chamber of Commerce

Indeed, the history of suburban development varies directly as the relief of the escarpment. (Fig. 3.) On the mountain top, across the bay from the city, there are suburbs, such as Waterdown, whose economic if not social life is relatively independent of the metropolitan area. These suburbs are separated in space from each other and from the central city, and their economic

level is low. They might be referred to as 'contact communities' because they are modified simply by external contact. Nearer to Hamilton itself, and on the same side of the bay, the mountain-top suburbs are typified by places like Ancaster. Here is an outlying community with a measure of self-sufficiency, but also with definite, internal relations to the inner city. Quite a number of men carry on their business or professional activities in town. Economically, there is a higher proportion of middle and upper class 'commuter' residents than on the opposite cuesta. Mount Hamilton, the nearest of all the mountain suburbs, is a part of the continuous built-up portion of the metropolitan area, though with local institutions, like its own community centre, and with local names like Mt. Albion, which testify to the influence of the escarpment as a barrier to complete absorption into the city.

The suburbs below the scarp are different both in function and form. Those which are farthest removed, and which were once independent scarp-foot towns, have become satellite settlements. They are cut off from the main city by physical barriers like the Dundas marsh and Burlington Bay, and tend, therefore, to be larger and more congested suburbs and to have important industries of their own. Nevertheless, their industries are dependent on the central city for financial aids, management, servicing, handling of products, supply of material and of extra labour; while the inhabitants regularly go to Hamilton for shopping and recreation.

By contrast, the nearer lakeshore sites, contiguous to Hamilton, tend to become "overflow suburbs" which are created expressly to attract or to provide for an overflow of population. Examples are Westdale, East Hamilton and Parkdale. These suburbs are not separate entities. Their inhabitants differ from those of the more remote satellite towns and mountain suburbs in that they live an important part of their

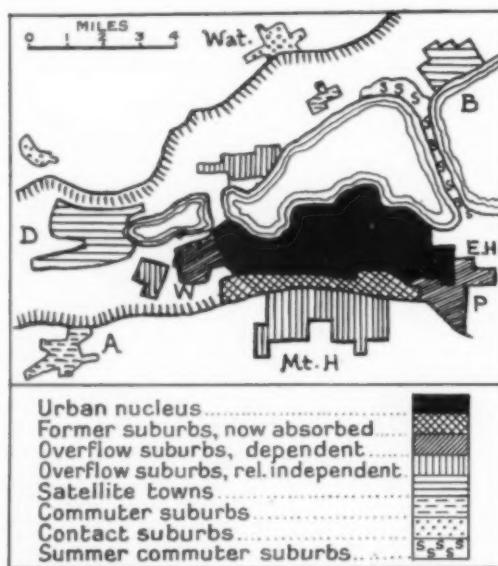


Fig. 3.—Suburban development, as controlled by local relief.



The beautiful west entrance into the city, which takes advantage of the high-level bar, a heritage of the ice ages. In the foreground, the Desjardine's Canal, leading to Dundas, is bridged by the projection of the Queen Elizabeth Way and the Canadian National and Canadian Pacific Railways. It was the successful competition of these railways which finally led to the predominance of Hamilton over Dundas, and the canal is now disused. The further ravines are bridged again to join the southern bar with the northern one, as in Fig. 4b.

C. H. Cunningham photo



The low-level bar, formed by Lake Ontario, which carries another arm of the Queen Elizabeth Way across the city, and also the Canadian National Railway. In the distance is the plain formed by the bed of glacial Lake Iroquois, and, rising above it, the northern escarpment. The bar is cut in two by the harbour canal. It forms a retreat to holiday crowds, who mingle along its sandy beaches. Summer cottages are scattered along its length.

C. H. Cunningham photo

lives in the urban centre of Hamilton itself, seeking their chief recreation, professional services and business contacts in that centre. As a result they have not developed into well integrated local communities, but are dominated by the life of the city.

Comparing these different suburbs, we find that the principles of suburban geography as given by Queen and Thomas are all well illustrated, and show the influence of the local site upon the expanding settlement. Another factor in the local site, the inequality of coastal development, has led to the very uneven distribution of population, by which the Hamilton district concentrates more than nine-tenths of its people on the south side of the bay. In brief, the northern coastal plain narrows as it approaches Hamilton, with decreasing room for settlement, whereas, on the south side the plain widens as it nears the city, allowing for considerable expansion. (Fig. 4a.) This inequality is a heritage of the ice ages when the waters of glacial Lake Iroquois bathed the foot of the escarpment. (Fig. 4b.) As Coleman has shown, the westerly set of the currents, together with the sweep of on-shore storms and the grinding of the winter ice, carried silt and sand away from the north shore toward the south, filling in the embayment between Burlington and Stoney Creek. Meanwhile, the streams of the Dundas valley were scouring the northern coast, further to prevent the building up of a coastal plain. Moreover, the streams derived from the south slopes of the mountain were longer and more vigorous than

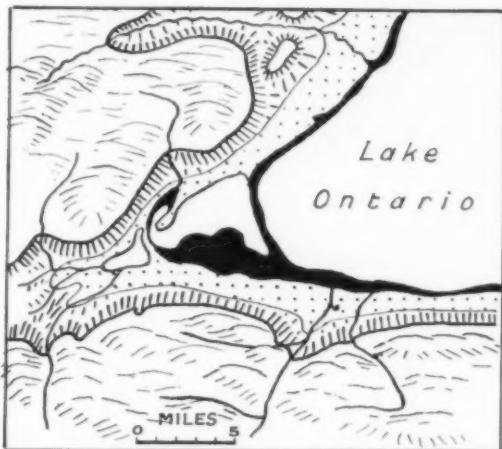


Fig. 4a.—Hamilton's local setting. The low-level Ontario plain (black), developed chiefly on the south, passes to the high-level Iroquois plain, and thence, by way of the Niagara escarpment, to the dip-slope till plain.

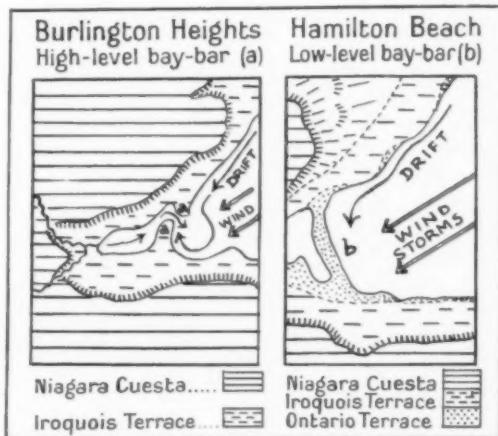


Fig. 4b.—The high-level and low-level bay bars, built by glacial Lake Iroquois and by Lake Ontario. The upper bar, known as Burlington Heights, consists of two approaching spits, which have been bridged by the famous high-level bridge, and which carry the main railways into the city. The lower bar, known as Hamilton Beach, is more complete, and has had to be cut by a canal to allow ships to use the harbour. It carries the Queen Elizabeth Highway and a railway spur.

those from the north side, producing extensive deltas in the ancient lake, of which the most famous is still known as The Delta. The present stream pattern is no less uneven. Vigorous, independent creeks on the Hamilton shore are still busy extending the area of delta; but a recent diversion of streams on the north has captured the drainage of the scarp, and brought it into the Dundas marsh. Consequently, it contributes nothing to the extension of the Burlington or Aldershot plains.

As a result, the local site consists of a wide high-level plain, the gift of Lake Iroquois, with prominent deltas pushed out by mountain torrents; and, in addition, a wide low-level plain, built up by the currents of Lake Ontario, with the intrusion of fresh and still growing deltas. And it is this multiplication of lake terraces which has established the city on the south shore, by making room for both industrial and suburban expansion, and by precluding such developments on the opposite shore.

The different levels on which Hamilton is founded have yet another significance. (Fig. 5.) They bring together very different systems of routeways into one centre, linking Hamilton, first, with the agricultural settlements on the dip-slope of the escarpment, such as Smithville and Caledonia; secondly, with the long string of old commercial settlements along the high-level Iroquois terrace, like Oakville, Dundas and Grimsby; and, thirdly, with parallel lines of newer industrial developments along the low-level Ontario plain, of which St. Catharines is an outstanding example. Nothing could have assisted the development of regional func-

tions in Hamilton, and of a regional significance, more than this favourable juxtaposition of interdependent economies. Its commercial connections helped to advance its agricultural and industrial ones; from the beginning some of its industries have exploited the agricultural market, especially its farm implement, insecticide, and fertilizer factories, and its great canneries; while, in the meantime, the growth of other industries has provided an expanding market for agricultural goods, and has extended commercial contacts farther than ever.

It is again due to local topography that these levels of settlement have been so effectively united. The great Dundas valley breaches the escarpment west of Hamilton, to attract the roads on its distant slopes, and lead them into the city down gentle gradients. Indeed, so significant was this valley in pioneer days that Dundas long overshadowed Hamilton as the chief route centre in the district, collecting, as it did, the eastern highways through the Niagara Peninsula, the western ones from London and Brantford, and the northern ones through Guelph or Toronto. In fact, it was not until railways superseded roads, and large-scale industry, requiring more room for expansion, replaced water mills, that Dundas finally lost its place to Hamilton. But the truth is, Dundas could never have been the focal point of all the three levels of development within the region. That point must lie somewhere between the mountain gap and the lake shore. (Fig. 6.) Consequently, when all three levels came into full play, Hamilton developed as the logical centre, particularly as it was reinforced by two other features. These are the high and low-level bars, which carry land connections across the upper stretches of the lake. (Fig. 4b.) These bars have been well described by Spencer and Coleman, who relate their development to the backwash currents created by the conflicts of the shore drift and the Dundas streams, together with



Fig. 5.—Hamilton and its environs. The different topographic levels have stimulated different economies, which are related to each other through their dependence upon Hamilton.



Industrial sites along the northern end of the city, facing the bay. This waterfront is composed of wide deltaic stretches with intervening creeks, is one of the best situations for industrial development in Canada, and a great asset to the city.

C. H. Cunningham photo

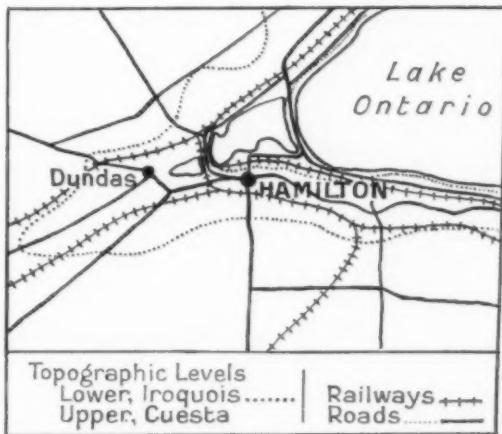
storms brought by the east winds. The high-level bar, known as Burlington Heights, was formed by glacial Lake Iroquois; the low-level one, called Hamilton Beach, is the work of Lake Ontario.

In the war of 1812, the nucleus of a settlement grew up about a fortress on the Heights, between Dundas and the lake, which was eventually to become Hamilton. When, by the middle of the century, the railways used the upper bar to connect their systems along the north and south shores of Lake Ontario, the ascendancy of Hamilton over Dundas was at last assured. Then the need to join all three belts of routes led to the emergence of the urban centre at King and James, which, dominating the upper roads from the Dundas valley and from Burlington Heights, also dominated the low roads from Burlington Beach.

This centre still serves the expansion of industry along the lake front, and of residential suburbs along the mountain slopes. But it is being squeezed into an ever narrower compass, out of which it has had to find escape in the office skyscraper, the hotel and the apartment block. At present, the city tends to expand upwards, in ever taller

buildings, rather than outwards. It has already extended so far to the east and west that the costs of city services, such as water and sewers, are disproportionately high. The slowing up of spacial expansion has compelled a higher integration to take place within the urban limits, with an ever closer correspondence between land form and settlement pattern, as each group, having a different function in the community, finds the facet of land that favours it the most.

Notice, for example, the concentration of large-scale, heavy industry on the low-lying Ontario shoreland—on deltas which can readily be turned into quays, and creeks which can easily be deepened into harbours.





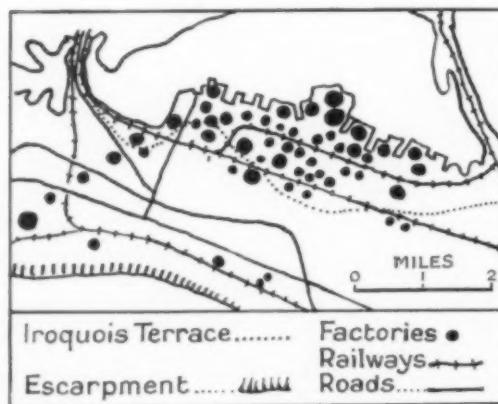
Hamilton is noted for its scenic surroundings as much as for its industrial and agricultural pre-eminence. Sunset over Coote's Paradise is a favourite spectacle. The contrast of placid lake, steeply rising scarps, and eroded terraces brings out the full beauty of the physical setting.

Courtesy Hamilton Chamber of Commerce

(Fig. 7.) As heavy industries, they owe their particular emplacement to the need of such geographical factors as, first, direct access to lakeborne traffic (since waterborne traffic is always their cheapest means of handling heavy material); secondly, the convergence of road and rail on the level surface of the Ontario plain (to reduce the cost of moving heavy material by land); thirdly, the presence of low-lying land which was regarded as undesirable for business and residential purposes (and could therefore be acquired at relatively cheap rates); fourthly, access to those parts of the city, which, being broadest in extent, were most likely to expand and might be counted on to supply, from their growing populations, an adequate and ready labour market; fifthly, a site from which refuse and smoke can be discharged least offensively and with the greatest of ease.

A word might be said about the nature as well as the emplacement of heavy industry. The iron and steel industry is one of the oldest and now employs about 38 per cent of the working population. In addition to steel plate and bars, forgings and iron castings, the industry produces an important proportion of the Dominion's rolling stock, structural shapes, pipes, metal doors, and wire goods. It is unlike most of the Great Lakes steel centres in not being on the direct stream of Superior iron ore, moving east, or Pennsylvania coal, moving west. But since the Welland Ship Canal was cut, it has been close to this trade; and, as a gateway to the eastern industrial market, it has been able to link this lake traffic to the chief demand for steel products, and so fulfil a profitable role.

Indeed, it is the convenient situation of Hamilton, near enough to United States sources of material, and yet within range of the greatest industrial market of Canada, that has drawn so many international concerns to it. As Professor Kenneth W. Taylor has pointed out, only three regions in Canada are accessible at once to regions of supply and demand: they are the Montreal district, Western Ontario, and Vancouver. Hamilton shares with Toronto, Windsor and London, the convergence of the Mohawk and St.



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Lawrence routes, and the approach of the Pennsylvania and Ontario mining areas.

The use of water power and of hydro-electricity has also prompted industrial development. The textile industry, which now employs some 18 per cent of Hamilton's workers, grew out of the use of excellent water sites just below the escarpment in Ancaster and Dundas, where mill power was associated with the most important road system and widest hinterland in Ontario west of Toronto. Since Hamilton is so close to American sources of cotton, has such cheap electric power, with relatively abundant labour, and with one of the oldest traditions in the manufacture of textiles, especially of knitted goods, in the Dominion; and since it has excellent facilities for redistribution of finished goods, it is likely to increase its important contribution in the textile trade. "From the standpoint of both the manufacturer who processes from the raw materials, to the one who purchases partially finished materials for further manufacture, there is no point more economical than Hamilton."

The city early developed an interest in hydro-electric power, and pioneered the first long distance transmission line in Canada to bring electricity from DeCew Falls, a distance of 33 miles, to feed the industries of the 'nineties. Since then, it has attracted many industries engaged in making electrical appliances, and now produces two-fifths of the heavier apparatus and one-quarter of the lighter equipment made in Canada. As a result, the electrical industry is third in local importance and employs 12 per cent of the working population.

The use of electricity has assisted the growth of many light industries, of which the most important perhaps is canning and preserving. Lying at the heart of the most important fruit and truck farming belt in the Dominion, and with cheap and adequate transport to the chief consuming market in Canada, and also to the overseas market, it is small wonder that Hamilton is "the head-

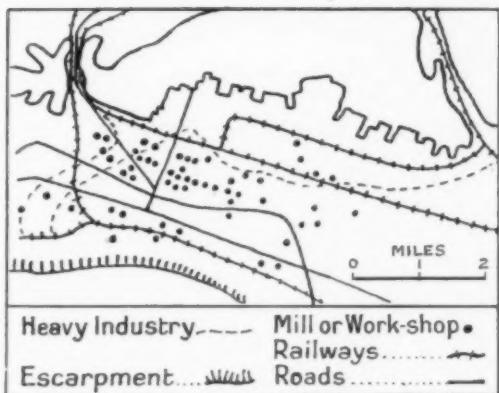


Fig. 8.—The location of small-scale industry in Hamilton. It lies mostly on the Iroquois terrace, nearer to the city centre, and is served by road rather than by railway.

quarters of the largest canning corporation of the British Empire".

A few special industries seem to respond to local circumstances. Thus one notes a flourishing bridge-building enterprise in the centre of a terrace terrain, where rejuvenation of streams, following the fall in post-glacial lakes, has deeply ravined the district and compelled a great deal of bridging. The pottery and brick kilns have made good use of the excellent clays and sands of these terraces.

The lighter, large-scale industries have a different distribution from the heavier ones. (Fig. 8.) Less concerned with access to the lake than with railway and road, they can afford to turn their backs to the shore, and compete for the land connections of Hamilton, the chief of which are on the Iroquois terrace. Examples would be the canneries, potteries, wire products, knitted goods,



An example of Hamilton's industrial initiative, the Steel Company of Canada has turned a low swampy area into an advantageous factory site. Close to excellent harbour and railway facilities, and with adequate room for expansion, it has become the largest steel producing unit in the Dominion, and has helped to earn for the city its title, "The Pittsburgh of Canada". C. H. Cunningham photo

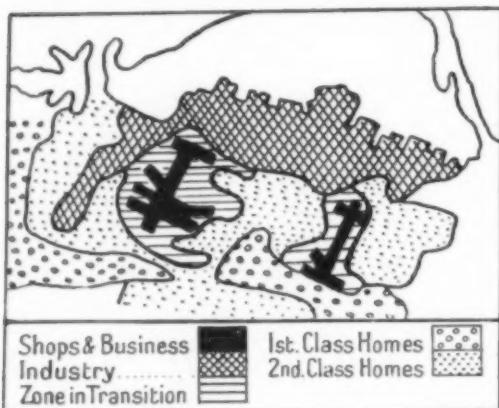


Fig. 9.—The chief functional zones of Hamilton, showing the urban nuclei, the zones of transition, the industrial and the residential zones. The western nucleus is the older, and by far the more important; the eastern one has grown with the eastern drift of industry, but is still dependent on the original urban centre.

paper goods, electric radios and lamps, to mention but a few. It is impossible, however, for such plants to compete with smaller scale and highly profitable concerns—such as warehouses, shops and offices—for the more central sites on the Iroquois terrace, and so they are left with its edges.

The rest of the terrace is crowded with what Gist and Halbert would call the controlling or servicing institutions of the neighbourhood, in contrast to the productive ones. These are the custom or fashion industries, usually small-scale but with a high margin of profit, the important wholesale and multiple stores, insurance offices and

banks, hotels, churches and theatres, and the municipal buildings. These institutions are not distributed without order. In fact, each is related to the other in exact proportion as it is able to buy a share of the nucleus of urban communications. (Fig. 10.) Thus, at the very centre of the region, where James Street crosses both Main and King, business offices predominate, along with nationally-known multiple stores, fashion centres and luxury shops; next in order are the restaurants, hotels and theatres; and finally come the civic buildings, metropolitan churches and terminal stations. Such places crowd the centre, either because they make the profit to afford it, or render the service to demand it. That their distribution is closely controlled by geography is seen by their function in the region at large. For example, the greater number of cultural institutions are situated to the south and west of the city, because they function chiefly for the residential suburbs along the mountain face and in the west end. Recreational institutions, on the other hand, are found very largely in the north and east, where the bulk of the working-class homes occur. Business straddles the main crossways, frequented from all quarters; shopping, the secondary junctions, where the more strictly urban routes meet.

In this way, the city has become "a patchwork of units which are spatially distributed according to the trend taken by the processes

McMaster University, set in beautiful grounds at the head of the lake, has stimulated the expanding cultural interests of Hamilton, to make it the educational focus for the Niagara Peninsula. Its magnificent gardens cover the edge of the Iroquois terrace. The Royal Botanical Gardens extend to the lake beyond, while, on the horizon, the wooded slopes of the Niagara escarpment may be seen.

Courtesy Hamilton Chamber of Commerce



of competition and selection . . . a trend in which the individual institution is drawn to the area in which it can compete most advantageously. Thus the city is no mere aggregation of individuals thrown indiscriminately together, but rather a growing organism, whose growth and expansion follow certain well established principles."

Hamilton has followed the development of these principles, first, as the population of the region around it has expanded and led to a process of urban concentration; then as this concentration produced a centralization of activities at the focus of greatest accessibility; and, finally, as centralization brought about the segregation of institutions with different economic and social functions. The process of segregation tends to develop distinctive urban zones. (Fig. 9.) For example, commercial and administrative institutions together with lighter industries segregate out to form two interior zones; heavier industries, working-class homes and better residential areas form the outer zones. The zoning is due to the different geographical needs of the institutions. Business and light industry cling to the centre because close contact with their market is required; time and service factors are important considerations, only a small ground area per worker is needed, and styles of production or display, which thrive from mutual contact, may be significant. Heavy industry, on the other hand, has failed to segregate out at the centre, but seeks the outer zones, because it requires highly specialized and large-scale buildings, a large ground area per worker, and large stores of fuel and raw material. These needs are met in the extensive deltas and creeks down by the bay.

In a city expanding as rapidly as Hamilton, however, the functional zones are not constant. As expansion proceeds, the outer zones are invaded by the inner ones. This is particularly the case in the region immediately around the urban centre. It changes so frequently that it may be said to exist in a state of transition. (Fig. 9.) In Hamilton, it is marked by a displacement of

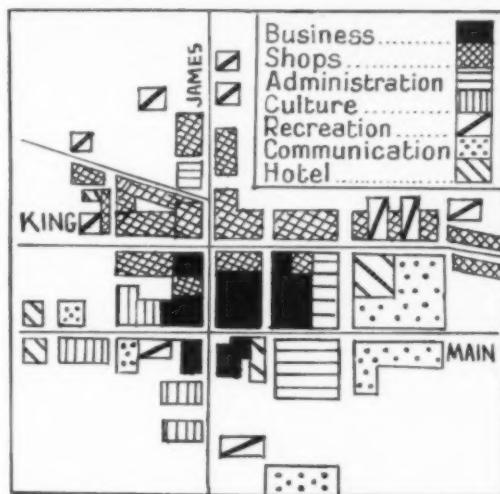
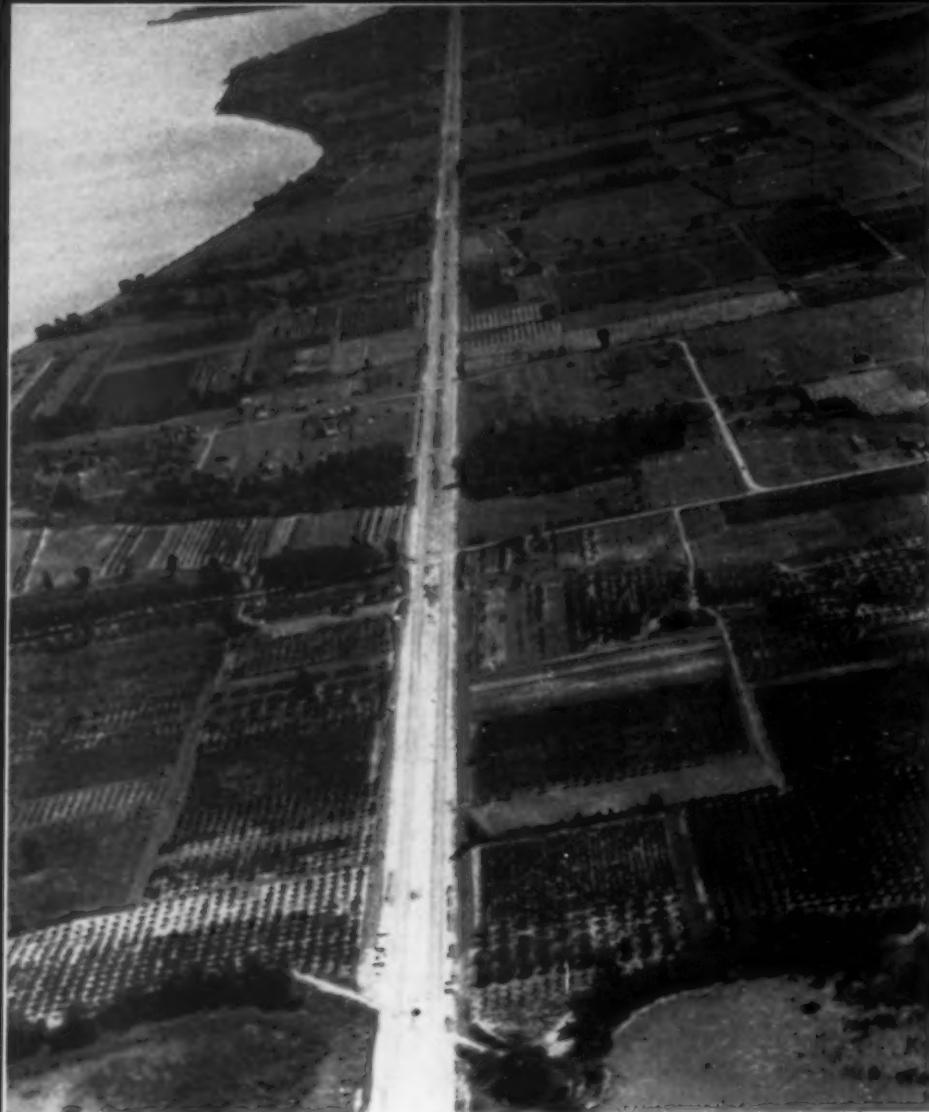


Fig. 10.—The urban centre, where different institutions segregate according to their ability to compete for the chief crossways.

local concerns by national or international ones; that is, where national trust companies have invaded local enterprise; national chain stores, such as Loblaw's, A&P, Eaton's, invade independent shopping spheres; where nationally operated hotels or apartment houses invade the place of private residence, isolating or squeezing out the older mansions; where nationally operated theatre corporations displace the indigenous recreation centres; and metropolitan churches invade community parishes to direct the cultural life of the city.

As a consequence, the whole area is in a state of change and of tension. Social surveys which I have made show it to be characterized by the greatest mobility of population, the largest number of immigrants to the city, the deterioration of its invaded blocks into slums, significantly little social participation, and the greatest social hazard. In its institutional geography, it typifies all three stages of development suggested by Queen and Thomas as the indigenous, the vestigial and the exotic. Indigenous to this zone of transition are such economic institutions as the market, between the commercial and industrial zones, and cultural institutions like the Hamilton Club, transitional between the old and the new cities. Vestigial remains are found in vacant buildings,



A stretch of the Queen Elizabeth road leading out of Hamilton eastward through the orchard country of the Niagara fruit belt, shows the density of agricultural settlement and the variety of products in the neighbourhood.

C. H. Cunningham photo

The famous Hamilton market; the largest and most diversified of its kind in Canada. As the focus of the Niagara fruit belt and also of a thriving dairy industry, Hamilton is an important agricultural as well as industrial centre.

Courtesy Hamilton Chamber of Commerce



marking the sites of displaced institutions, such as flour and feed mills near to the market, or neighbourhood halls, which no longer have a neighbourhood function. Exotic elements are provided by hotels and dance halls, which cater to the night life of the community, and also by the Salvation Army, the Children's Aid and Family Service bureaux, that seek to heal the tensions of the region.

From these brief examples, it will be seen that the geographical environment of any district conditions its economic development, and this, in turn, conditions the social environment. In this respect, Hamilton behaves very much as Warner and Lunt have shown typical American cities to behave. The greatest contrast is between the north end and the mountain face, between the predominantly industrial, working-class areas and the residential middle-class zones. The industrial neighbourhood is the only one where men number more than women, where there are more children than parents, where the greatest number of foreign-born immigrants and of alien cultural institutions are found, and the number of poor and unemployed families is at least three times higher than anywhere else. The people live predominantly in small, overcrowded homes, packed close to each other, or in rooming-houses and multiple dwellings: very few live in large, self-contained homes. Their social life is characterized by a higher membership in male fraternities than in any other zone; and they are affiliated in significantly high numbers with the Roman Catholic and the

evangelical faiths. If their children go beyond public school, more than two-thirds of them enrol in technical or commercial courses.

By contrast, the suburban zones in the south and west have a much greater proportion of women, fewer children, relatively few foreign-born, and virtually no one who is unemployed or on relief. Three-quarters of the neighbourhood live in medium to large-sized houses, which they own and keep in good repair; and less than one per cent live in houses in poor condition. Both men and women have a significantly high membership in social and charitable clubs: indeed, it is to their direction and support that most of the social, charitable and cultural institutions look. Their children proceed to high school as a matter of course, and many of them continue right through to university. A higher proportion get a liberal arts education than from any other group.

These differences are the result of modern urban trends "in which the individual . . . is drawn to the area where it can compete most advantageously. If it is successful it moves to the area of maximum rather than minimum choice." But that area is at all times changing. In Hamilton, the vast expansion of the industrial zone, and the corresponding growth of the urban centre has steadily invaded the residential areas, causing the older families to migrate from their initial commanding sites southward to the mountain, and thence west and east to the University, or Gage Park. (Fig. 11.) Their erstwhile homes have become offices, or rooming-houses, or else they have disap-

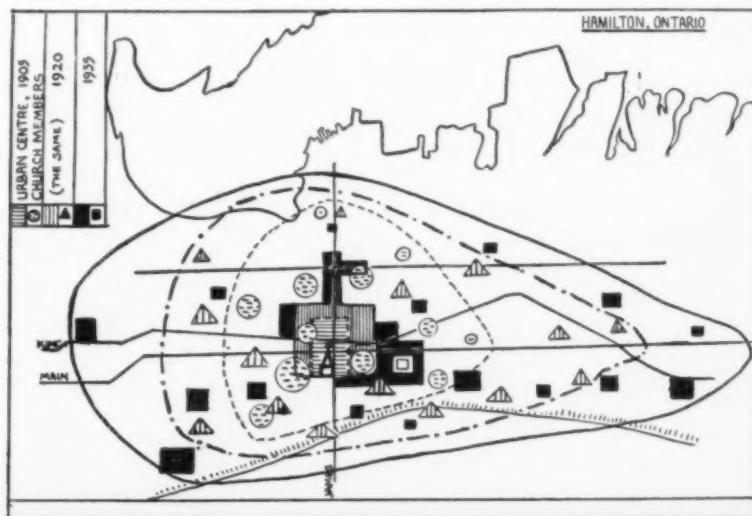


Fig. 11.—Growth of urban centre, Hamilton, and its evacuation. Constriction between the mountain on the south (hatched) and the bay on the north, has compelled the city to expand laterally. Scale, 1 inch represents $1\frac{1}{2}$ miles. Size of symbols is proportional to number of members.

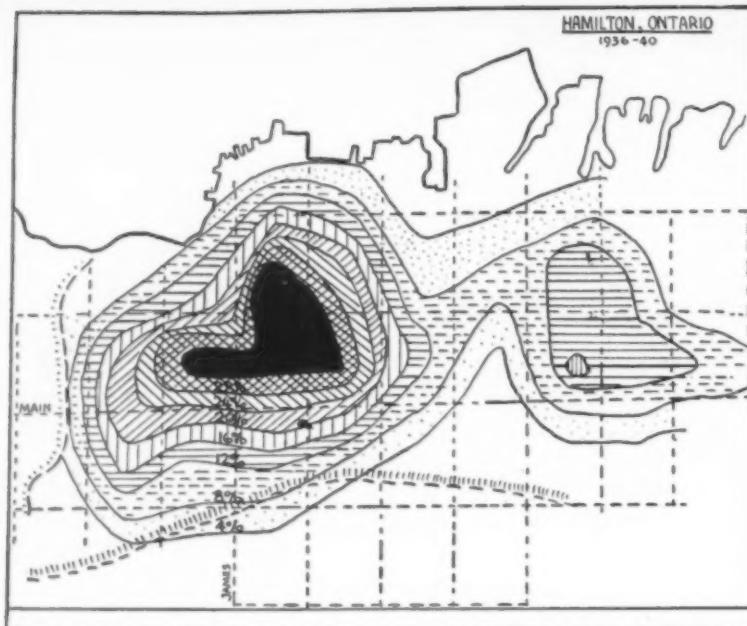


Fig. 12.—Incidence of case loads of social agencies, showing percentage of total number of cases registered in unit areas of $\frac{1}{3}$ of 1 square mile, or 64 city blocks. Scale, 1 inch represents $1\frac{1}{4}$ miles.

peared entirely to make way for shops and factories. Crowding in behind them have come the immigrants from the countryside, or from abroad, who fill up the subdivided homes, or the new multiple dwellings, where rents are low and transportation costs are at their minimum. These people are often changing their jobs, and they will change their rooms and their associations in the neighbourhood with the same social results. Recreational surveys have shown them to possess few regular social connections; indeed, nearly a quarter of their children specify no recreational interests, and are without membership in any club. It is not surprising to find, therefore, that 67 per cent of the juvenile delinquency of Hamilton occurs in the very limited area where friction between the chief urban zones is at a height.

I have indicated elsewhere that this transition zone, where the industrial interests are gradually superseding residential ones, and where economic ends replace social ones, exhibits a concentration of up to 70 per cent of the social hazards of the city in about 15 per cent of its area. (Fig. 12.) It offers a supreme challenge to the community, especially with reference to post-war plans, calling, as it does, for better housing and working conditions, better recreational and cultural facilities, and the higher social integration of the city in community living.

That these social conditions are not accidental is seen from the fact that they are related in every case to the economic and geographical environment. In fact, the social development of Hamilton clearly confirms the connection between place, work and folk that is responsible for the character of each and every neighbourhood. That is to say, place conditions the work done in that place; and work conditions the folk who are engaged in that work; and, finally, the type of folk will condition the cultural expression of the neighbourhood. These are the essential relationships of geography; and so, to know your neighbourhood is the first step to knowing your geography.

Appendix

The settlement of Hamilton began in 1778; it was surveyed as a town-site in 1813, and incorporated as a city in 1846, when it had a population of 6,832. Twelve years before this, the cutting of a canal through the bay bar made Hamilton a potential port. In 1853 it became a railway hub. International industry was attracted to the site as early as 1871, and in its subsequent expansion has been largely responsible for the growth of the city. The population is now in excess of 175,000, with an employment roll of over 35,000 workers in 471 plants. It has "the largest industrial production per capita of any city in Canada".



THE CANADIAN GEOGRAPHICAL SOCIETY

ANNUAL GENERAL MEETING

The Sixteenth Annual General Meeting of The Canadian Geographical Society was held on March 20th, 1945, in the Lecture Hall, National Museum of Canada, Ottawa, Mr. C. G. Cowan, President, presiding.

The President, after welcoming those present, made reference to the great loss sustained by the Society in the death of Dr. George J. Desbarats early in the year when serving his second term as President.

In his address, opening the business proceedings of the Annual General Meeting, the President reported that throughout the year 1944 the Society had fully maintained its position as a useful and influential Canadian cultural organization. Further funds were allocated for the conduct of geographical research projects, and the Society's credit balance was increased. "There have been many tributes to the usefulness of the Journal and to its gradual improvement both as to content and format, all of which is reflected in the largest circulation for the past ten years, both with regard to membership and newsstand sales. In addition, the Society has been able to send again to our soldiers overseas over 25,000 copies of the Journal, supplied without charge.

"Furthermore, the fact that the Journal is a useful and interesting medium for the publication of information about Canada is shown by the development of foreign circulation largely through our diplomatic representatives and trade commissioners. Undoubtedly the Society, in common with radio, film and public information services, is doing its part to make Canada known to the outside world where information is eagerly sought, largely owing to the magnificent publicity which this country has received on account of its wholehearted participation in the war.

"At a time like this, opportunities for research are necessarily denied, but something has been done in adding another film to the Society's documentary films on power and transportation in Canada. During the last few months the National Film Board has distributed two of the Society's films throughout the country as part of its regular programme, and it is estimated that about 700,000 people have had the opportunity of seeing them."

The President also referred to the recent establishment of a Department of Geography at McGill University, headed by Lt.-Com. J. H. Kimble, Royal Navy (retired).

Following the conclusion of the business portion of the Meeting, a most interesting and informative address was given by Maj.-Gen. W. W. Foster, C.M.G., D.S.O., Special Commissioner for Defence Projects in Northwest Canada. After touching upon the history of that portion of the Dominion, Gen. Foster explained its strategic geographical importance both in the political and military sense. He gave a brief résumé of the military pacts for world control between Germany and Japan, the ensuing "Battle of Logistics" that had led to the necessity of assuring the defence of the Pacific Coast by the building of the airfields of the Northwest staging route, the Mackenzie air route, the Alaska Highway for the maintenance of these airfields and the exploitation of Norman Wells, including the hundreds of miles of pipe lines involved, for the refuelling of planes. "The cost was a small thing when we think of what was to be preserved: Life, Liberty, Happiness—if by virtue of these projects the war on the Pacific was shortened by only *one day*, that one day less would pay for all these projects." Following Gen. Foster's address, a coloured motion picture on the Alaska Highway was shown.

The retiring ten Directors of the Society were re-elected to office for a further three-year term, and at the Board of Directors' Meeting held immediately after the Annual General Meeting, the President and other Officers for 1945 were re-elected, and the Editorial Committee of 1944 was re-appointed for 1945 (see Directors' page).

EDITOR'S NOTE-BOOK

M. B. Davis, whose article on Canadian dehydrated fruits and vegetables appears in this month's issue, was born in Yarmouth, Nova Scotia, and received his training at the Nova Scotia Agricultural College, MacDonald College, University of Minnesota and the University of Bristol. He was one of the five men who established the United Fruit Companies of Nova Scotia and was the first secretary of the organization. Mr. Davis came to Ottawa in the latter part of 1913 as assistant to the Dominion Horticulturist, served overseas in the early part of 1916 until the end of the First Great War with the No. 7 McGill Siege Battery, and, in 1933, succeeded the late Dr. Macoun as Dominion Horticulturist.

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Lawrence J. Burpee—See C. G. J. for April, 1945.

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J. W. Watson—See C. G. J. for September, 1944.

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Arthur L. Neal—See C. G. J. for March, 1945.

* * *

Kathleen S. Weeks—See C. G. J. for July, 1943. We regret to announce that Miss Weeks, after a brief illness, died in November, 1943. "Monuments Mark This Boundary" represents her last completed manuscript.

* * *

AMONGST THE NEW BOOKS

Climate of Indiana by S. S. Visher, Indiana University,

1944

(511 pages, 486 maps and diagrams)

THIS is an important contribution to climatology for a number of reasons. Professor Visher is well known for the number and value of his papers and books on various aspects of climatology. These are based on his extensive travels in part; and the reviewer first met him while he was studying, in the field, the climates of Australia. The book under review is of note as one of

the few complete studies of a large, and populous part of the United States. No other volume as comprehensive is known to the reviewer, though a full study on similar lines has been made of the climate of Chicago. Thus this book will serve as a guide to future workers who plan to prepare detailed accounts of man's relation to his climatic environment.

There are 27 chapters in the book, some of which are naturally of less interest to the reader who lives outside Indiana than are the more general discussions. The first chapter shows us why Indiana is a particularly interesting portion of the United States. It is so far south that on June 21st the sun is more nearly overhead than it is at the Equator. It is so far inland that it has a very cold winter, and the average annual temperature is around 53 degrees. The hot summer suits one of the world's best crops (maize), but is distinctly too hot for best physical or mental effort. The optima for these are about 64° F. and 40° F., respectively.

As regards agriculture, Indiana is very favourably situated. About 100 Lows (cyclones) cross the state each year, each bringing its quota of rain to the farmer; and the tropical 'air masses' (which are so important as rain-bringers) move fairly regularly up the Mississippi Valley into Indiana. Here the polar air masses under-run the warm moist air, and the resultant cooling produces a very satisfactory type of rainfall for maize and other important farm products. The state has its highest elevations in the east and its lowest in the southwest. Visher points out that this direction of the slope affects the winds and the movements of the Lows, in general to the advantage of Indiana. His remarks as to the influence of Lake Michigan on the climate of adjacent districts could well be read by all folk who live in the Great Lakes region.

The three following chapters deal with temperature variations, and are followed by five chapters on rainfall characteristics. Floods, sunshine, winds and tornadoes are all considered, and are charted in a hundred or so maps of Indiana. Some of the concluding chapters will have more interest for the Canadian reader, such as those dealing with "Climatic Change" and "Crop Yields". An interesting graph shows that, during the last forty years, the precipitation of the United States has been falling, and the temperature rising. Visher believes that the summer rainfall of Indiana can be deduced by observations of the pressure at Bermuda during the preceding autumn. Dr. Rose's conclusions as to the effect of climatic variations on the maize yield are discussed. These were carried out when Dr. Rose was working with the reviewer at Chicago for his Ph.D thesis, and have already proved of great interest. Perhaps the sole criticism that the reviewer can make is that a few topics, such as the climate of the seven legal holidays (Chapter XIX), are given too much prominence. All Canadians who realize how greatly the prosperity of a province depends on climatic control will find this book of great value and interest.

Griffith Taylor

Canadian Restoration by A. NEWTON-WHITE

(The Ryerson Press, Toronto, \$2.50)

MR. NEWTON-WHITE is a resident of Northern Ontario, who appears to have an intimate, first-hand knowledge of Canada's forests and frontier farms and who sees the problem of the post-war years mainly as the task of restoring our forest resources, which have been so recklessly squandered in the past. It is an undisputed fact that much of our area is suitable only for forests and that the future prosperity of the nation is largely dependent on a wise and far-sighted policy for the conservation and development of these forest resources. Mr. Newton-White suggests the establishment of community forests, the development of forest lands in individual holdings of reasonable size, and the association of forests units with the farming of marginal lands.

Much official attention is now being given to the subject, as is evidenced by the account of the Ganaraska project published in this *Journal* a few months ago and the final report on the same subject issued shortly thereafter. While both this report and the present book start from the same premises, Mr. Newton-White suggests solutions that are, for this country, a distinctly new approach to the problem of forest restoration. This is an excellent and thought-provoking book.

P.E.P.

* * *

*CANADA'S WAR AT SEA**Canada and the Sea* by STEPHEN LEACOCK*Canada and the War at Sea* by LESLIE ROBERTS

(Alvah M. Beatty, Montreal, \$3.00)

FOR many years Canadians have turned their backs upon the seas which bound their country east and west and upon which their produce is borne to the markets of the world in ships of other nations. It would appear that the great development of the agricultural lands of the West and of the mines of the North in the present century has made us forget the trade of the sea which has always entered so largely into our economy and whose story is so delightfully told by Stephen Leacock in the first section of this book. Dr. Leacock writes with the skill, wide knowledge, and historical background which has made his work unique among Canadian writers and reconstructs for us a past in which the ships of Canada were known on every sea and when we carried not only our own but a surprisingly large part of the world's commerce.

Leslie Roberts, in the second section of the book, tells of the part that the Canadian Navy has played in keeping the sea lanes open in the present war. This story is an epic in itself in which a land-minded nation extemporized a shipbuilding industry to create a navy and manned it effectively with young men from farms and cities, who, in many cases first saw the sea from the wave-washed decks of a corvette on the stormy convoy lanes of the North Atlantic. Canadian warships have seen action and bitter fighting, but the main duty

of our Navy has been the drudgery and unremitting watchfulness of escort duty, whose success is not measured in terms of enemy losses but in the safe arrival in port of the convoys entrusted to its care. Mr. Roberts knows our Navy and the men who man it, and the reader will hope that, when the final score is posted, and the last U-boat swept from the seas, it will be his pen that will write the long story of Canada's Navy.

Further sections of the book give an account of the merchant marine and the stout lads who, undaunted by strafing from sea and air, have kept the stream of supplies flowing to Britain, and of the shipyards which have built our Navy and the great fleet of victory ships which now fly our colours. The book is excellently illustrated and contains nearly one hundred pages of advertising which is by no means the least interesting part of the book, showing as it does the achievements in industry that have made possible all that Canada has accomplished in her war at sea.

* * *

Your Servant the Molecule by WALTER S. LANDIS

(The MacMillan Company, \$3.50)

THE author, Dr. Landis, is an important executive in the chemical industry and has written extensively on this subject for the technical reader. The present book appears to be inspired by an honourable desire to provide a popular account of the achievements of chemistry and of the great part it plays in almost every phase of our industrialized civilization—so largely unappreciated by the average citizen.

Dr. Landis avoids, as far as possible, the pitfalls of technical jargon which so often mar a book of this description. It would be an impossibility, however, to describe chemical processes without resort to some words that are beyond the vocabulary of most laymen, and the chemical formulae, necessarily in evidence throughout, are sufficient to make us realize our good fortune in playing a humble part in a world where chemistry is done by others. Subject to technical correction, Dr. Landis appears to cover the whole field of chemistry in its relation to modern industry. To advert to the science of an earlier day, the importance of some few chemicals such as sulphuric acid or hydrochloric acid in almost every process seems to indicate that the alchemist's dream of some superpotent compound, possessing power over other elements, has become a reality of modern chemistry. The mysterious functions of catalysts, the incredible number of compounds that are derived from coal and crude oil, the gruesome by-products of the slaughter-house that are refined into the equivalents of ancient elixirs; all these would constitute sufficient evidence, in a not distant time, to send their producers to the stake or the scaffold. They are equally mysterious to-day.

An excellent book and highly recommended to those who like to know what science is doing for their comfort and well-being.

P. E. P.

CANADIAN GEOGRAPHICAL JOURNAL, May 1945

Copper—the Red Metal by JUNE M. METCALFE
(Viking Press, New York, \$2.50)

A LADYLIKE and superficial account of the copper industry. The illustrations are excellent.

* * *

Colonies by ERIC A. WALKER
(Cambridge University Press, MacMillans, \$1.10)

THERE are as many viewpoints and misconceptions on the subject of colonies as on any current political question, ranging all the way from the standpoint of the ultra-imperialist only too ready to bear "the white man's burden" to the line of the pinkish intellectual to whom all colonies are anathema. Professor Walker approaches his subject fairly and objectively. He examines the policies of the great colonizing nations and attempts to analyse the results of those policies in their effect on native peoples and on the parent state. Wrongs there have been, undoubtedly, in the past and many may still exist, but on the other side of the ledger there have been successful efforts to improve the status of native populations in health, security and economic conditions. The primitive man, so idealized in the eighteenth century, too often existed in filth, sickness and misery; his life and freedom in daily jeopardy. His position now, as a colonial subject of one of the great powers is, perhaps, not relatively worse than that of many of the poorer citizens of that same power, although his inequalities may be emphasized by conditions of race or colour.

This book should particularly interest Canadians who have so recently and so self-consciously emerged from the colonial state. In a more elaborate format, decorated with endmaps and a suitable blurb about the author, it might more easily catch the eye on the bookseller's shelf, but such adornments would add nothing to his sound and painstaking piece of work which appears in so unpretentious a guise.

* * * P. E. P.

Snowshoe Country by FLORENCE PAGE JAQUES
Illustrations by FRANCIS LEE JAQUES

(The University of Minnesota Press, Minneapolis, 1944,
\$3.00)

SNOWSHOE COUNTRY is a delightfully written and charmingly illustrated account of that borderland, partly American and partly Canadian, along the International Boundary west of Lake Superior, a region of lakes, rivers and pine forests seldom visited by Canadians—to their very great loss. It embraces the Quetico Park of Ontario and the Superior National Forest in Minnesota, a region that a few unselfish enthusiasts have been trying for years to persuade the governments concerned to set apart as an international playground, along similar lines to the Glacier-Waterton International Park. That statement should, however, be qualified, as the Government of the United States has given its whole-hearted support to the idea, and has spent a great deal

of money in buying land that had fallen into private hands.

Mr. and Mrs. Jaques spent four months in this wilderness area, and learned to know it and to love it in both its autumn and its winter moods. They found that its winter landscape and spicy atmosphere had a character and appeal entirely their own. For the most part they were alone, though never quite alone with squirrels and rabbits, moose and deer, woodpeckers, porcupines, beaver, and other wild creatures, as neighbours and their sled dogs as companions. Sometimes on snowshoes and sometimes in dog-sleds they explored their temporary empire, finding knowledge and experience, health and enjoyment, in the one inimitable way. It is not practicable to reproduce Francis Lee Jaques' pen-and-ink sketches, but this may suggest the quality of Mrs. Jaques' description. She is describing the winter landscape:

"These subtle colors have no richness, but a strange and deliberate power. The infinite gradations of faint rose, clear blue, or pale gold over the vast stretches of snow come from no frailty, but from a hidden strength such as a pearl has. The purity of line, too—however fragile it may be, it is distinct and sure. These simplicities of curve and shadow make one feel that they are preliminary sketches of a fresh earth made just before I came upon them. This morning the ice was a frail amber color, changing to soft grass-green in the shadow of the hills. The sky was made of transparent and delicate beryl, and the hills were dusky dark."

This book is the handiwork of two artists, one in pictures and the other in words.

Like many Americans who have travelled about this continent, they envy us our magnificent heritage of national parks.

"Lee and I," says Mrs. Jaques, "took a morning walk across the lake. We always like to head towards Canada. It is so rich in the wilderness the United States has for the most part lost."

To our shame we are, particularly in this border country, doing our best to ruin our heritage. We have excellent laws and regulations for the protection of our forests, but too often they are not enforced. Speaking of a place near the boundary, Mrs. Jaques says:

"On this point the men are salvaging the huge trees that were torn up by the roots and knocked over by bulldozers in the lumbering done by a Canadian company last year. It looks as if war had devastated the place."

This sort of thing is done, and permitted, on the pretext that it is necessary to get out timber urgently needed in the war effort. What crimes are committed in the sacred name of patriotism!

L. J. B.

* * *

Out of the West Land by LOVAT DICKSON
(Collins, Toronto, \$3.00)

THE author, Lovat Dickson, spent some of his early years in Canada and was educated at the University of

Alberta. This, his first novel, is apparently largely based on his own experiences in Canada recollected, none too clearly, through the veil of twenty odd years. The central figures are a young Englishman of good background and the daughter of an Albertan squire, if there are squires in Alberta. The young man comes to Canada, rather inexplicably, to attend the University of Alberta, but, under the influence of a farmer casually encountered *en route*, decides to try farming instead of higher education and obtains work in the cow stable at the Experimental Farm in Ottawa. Soon tiring of the dairy business, he decides to lend his assistance to the coal mining industry of Alberta, where he meets the young lady referred to above. Finding her to be a student at the University, his desire for education suddenly returns and he himself enrolls. Inevitably, he falls in love with the lady who, to a degree, returns his affection, but permits her heart to be diverted to a member of the British Foreign Office, engaged on some mysterious diplomatic duty in Edmonton. Possibly he was negotiating a treaty with Mr. Aberhardt. Becoming engaged to this wandering diplomat, she experiences, after his return to England, a woman's privilege and decides she loves our hero better. Some tender and intimate passages occur just before she is taken to England by her parents to visit the official fiancé. It there transpires that those tender passages may not have been without unfortunate results, so she immediately marries into the diplomatic service. Then the war, and our leading man turns up again, this time as a wounded officer in the R.A.F. in London where their love again triumphs over the established position and fifteen thousand pounds a year of the husband. This amorous interlude was terminated by her lover's death in the battle of Britain. The lady then decides that her duty lies with her husband, whose diplomatic qualities have withstood every strain, and the book ends with the satisfying prospect of an heir to the fifteen thousand per annum.

This book most certainly will not qualify as the great Canadian novel. The plot is thin, the characterization, except in one or two instances, is decidedly weak, and Canadians will have difficulty in recognizing either themselves or their country in the picture of Canadian life drawn by the author. The last few chapters describing the blitz in London are quite the best in the book and are really excellent reading, though perhaps hardly worth the tiresome journey necessary to reach them.

P. E. P.

* * *

The hero of *The Transplanted*, Robert Wallace, whose youthful imagination had been stirred by the reading of the adventures of Alexander Mackenzie, David Thompson, Simon Fraser, and other great explorers of the Canadian West, might well have been Niven himself. Wallace became a mining engineer, and it is his journey to make a report on a mineral prospect on "Elkhorn" Creek that marks the real beginning of the present story. His own romance, his friendship with

John Galbraith, another Scotchman, and the latter's love for Marion Masters, a young woman with a past, are some of the highlights of the book. Back of all, however, is the country itself, which Wallace loved; to him the development of its resources—mineral, forest and agricultural—was a continued challenge. To those who know the western mountains, this geographic setting is perhaps the most attractive features of the volume.

F. J. A.

* * *

"Mountain Growth, A Study of the Southwestern Pacific Region" by WILLIAM HERBERT HOBBS, Professor Emeritus of Geology, University of Michigan (Vol. 88, Number 4, *Proceedings of the American Philosophical Society*, Philadelphia, October 18, 1944, pp. 221-268).

THIS is a work that all students of structural geology and those interested in how mountains are produced will read with a great deal of interest. It appears at a very suitable time when the attention of every one is directed to the Pacific war theatre. Names of islands from Japan to New Zealand, many of which were mere words to most of us a few years ago, now are familiar to all. The numerous excellent maps and diagrams greatly facilitate the reading and understanding of the text. The study is based on field work carried out by the author in 1918, '21 and '23, and on information from other writers and observers.

The Pacific Ocean is a sinking region. Since Cretaceous time its floor has settled at least 10,000 feet, and the high seismicity of the region shows that adjustments are still continuing. Mountain building is interpreted by Hobbs as being due to thrusting from the seaward side; i.e., underthrusting, forming folds or wrinkles within the outer shell of the earth. The Pacific mountains are so young that erosional agents have not had time to greatly modify them, and, as a result, they provide an excellent subject for study. The principal lines of approach include the outlining of mountain trends, and the distribution of volcanoes. The andesitic lavas of the mountain belts are interpreted as fused shales, quite different from the basalts exuded within the subsiding belt. Hobbs' own summary concisely states his conclusions:

"There are two major types of mountains: (1) arcuate (folded) mountains, which form near the margins of vast subsiding areas, the basins of the oceans; and (2) extravasation mountains formed along fractures within the subsiding areas.

"The arcuate mountains appear to develop where there is an initial dip in the ocean floor. The early pattern to rise is a series of arcs which are convex toward the subsiding area, from which the actuating thrusts are directed. In profile in the early stage they are made up of a flattish anticline behind a well-defined syncline, a trough of the sea. As the anticline evolves further, volcanoes rise at the back of the crest and exude lava of an intermediate composition, andesite—the composition of mudstone or shale. Terraces, which

(Continued on page XVI)

(Continued from page XIV)

in tropical seas are veneered with reef limestone, are notched on the rising front of the anticline, while barrier reefs are forming on the sinking back. In later stages the arc is of sharpened curvature, and erosion mutilates more and more the model of its surface.

"Within the Pacific region, the youngest folded mountains compose a festooned rim which is marked by a belt of excessive seismicity and is sharply set off from the vast subsiding region at its front. This partition line, which separates mountains of the two major types in the southwest Pacific area, starts near Japan, continues east of the Marianne and Pelew Islands; then north of the Bismarck, Solomon, New Hebrides, and Fiji Islands; and then, turning southward, borders on the east the Tonga, Kermadec, and New Zealand Islands."

F.J.A.

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Le Canada par l'Image, by BENOIT BROUILLETTE
(Librairie Beauchemin, Montréal 3rd. edition, 1944.
\$1.00)

THOUGH this French textbook of the geography of Canada is designed primarily for students of Quebec Province, it should prove scarcely less valuable and attractive to the general reader who wishes to brush up his French and, at the same time, measure and increase his knowledge of his native land. The illustrations are well reproduced from a wide variety of interesting photographs showing views of cities, rural scenes, harbours, rivers and canals, fisheries, factories, bridges, mines, in short, "des principales manifestations du pays au travail".

The author feels that geography, as an interesting and useful study, has been neglected, and, in his introduction, proceeds to show how important a branch of education it is and why he thinks it can be presented in a vivid and impressive manner to students in our schools and colleges. He traces the evolution of geography as a science through the ages from the earliest map-makers. He characterizes as *Itinerary* the first geographic works, when the chief preoccupation of men was to indicate the distance of one place from another. It was, then, a science of positions.

Then man applied himself to naming places, baptizing rivers, mountains, localities. Since remotest times no accident of relief has remained anonymous. The Indians have given to Canadian geography names full of meaning, of which, unhappily, there exist too few examples. This, Dr. Brouillette says, might be termed the *topography dictionary* stage of geography.

Geography became *descriptive* when man set himself to explore and describe the world. This was, above all, the epoch of great discoveries. From the thirteenth to the nineteenth century, we see travellers, pilgrims, adventurers pouring out, in geographical books, the marvels opening before them in countries hitherto unknown.

It was only in the second part of the nineteenth

century that geography became "explanatory". Men like the two Reclus and Humboldt travelled everywhere seeking an explanation of land forms, of types of climate, of the flow of rivers. Geography became truly a *science*, since it brought to man a more rational knowledge of the earth which he had conquered. Other great masters of this period are Vidal de la Blache and Marcel Dubois of France, Ratzel in Germany, Süss in Austria, and their immediate disciples, Jean Brunhes, Albert Demangeon and Emmanuel de Martonne.

Coming down to present-day methods of teaching, Dr. Brouillette describes the modern student's direct observation in walks and talks in the immediate environment, followed by "l'observation indirekte" of the world beyond, by means of books, lantern slides, maps and photographs, which widen the student's horizon and stimulate his interest and imagination.

In accordance with this regional method, the first chapter of Dr. Brouillette's book deals with the city of Montreal, its situation and the maps upon which to base one's study, giving a practical list of those available from various government departments and private firms. He proceeds to describe its physical features, relief and climate, its structure and geological history, the latter so exceptional that it cannot fail to excite the most indifferent young Montrealer. There follows detailed accounts of the human factors—growth and distribution of population since its foundation as Indian Hochelaga, the economic aspects—transportation and commerce and industries, with rather brief mention of the provisions for its intellectual life.

In Chapter 2, the author then passes on to a similar treatment of the Province of Quebec, naturally expanding and subdividing the various headings to cover the greater extent and variety of country, its physical features and its industries and resources. Chapter 3 presents a study of the whole of Canada, again giving valuable references to maps and books available and the most recent statistics as to population, natural resources, wild life, agriculture, mines, and minerals, industries and commerce, etc.

Quebec is fortunate in having as professor in its École des Hautes Études Commerciales de Montréal so eminent a geographer as Dr. Benoit Brouillette. A graduate of the above school in 1928, he studied in France for three years under the famous masters De Martonne and Demangeon, returning as Doctor of Geography in 1931, to his appointment as lecturer in geography, becoming full professor in 1940. Dr. Brouillette has written two notable books of scholarly research and contributed chapters to four others, as well as writing many articles for periodicals. In addition to his teaching, he travels throughout the province, giving a series of lectures every two years. He also has represented geography in the Canadian Social Sciences' section of the National Research Council since 1940 and spends his summer vacations in research work on natural resources for the provincial government.

F. E. FORSEY